INTERNATIONAL EXHIBITION OF 1862.

OFFICIAL ILLUSTRATED CATALOGUE

TWELFTH PART.

CLASS XXXI. *Iron and General Hardware.*

CLASS XXXII. *Steel and Cutlery.*

BIBLIOTHEK·DES·DEUTSCHEN·MUSEUMS·MUNCHEN

[1162]

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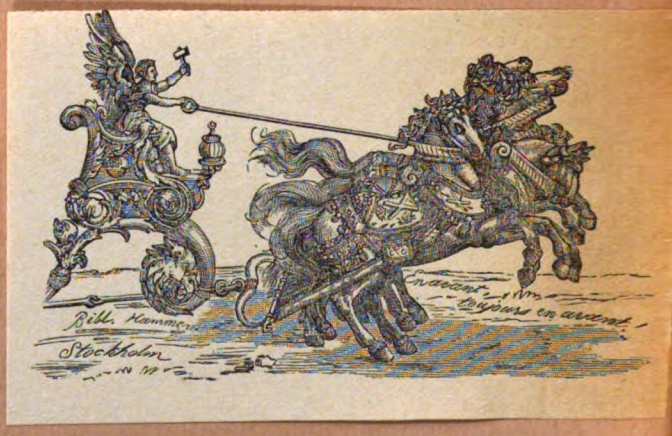

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CLASS XXXI.

IRON AND GENERAL HARDWARE.

DEUTSCHES MUSEUM MÜNCHEN BIBLIOTHEK.

SUB-CLASS A.—*Iron Manufactures.*

[5968]

ABBOTT, WILLIAM, 3 *Royal Terrace, Richmond, S.W.*—Perforated cages for birds, &c.

[5969]

ADAMS, WILLIAM S., & SON, 57 *Haymarket,* 14 *Norris Street, and* 54 *Whitcomb Street, Pall Mall East, S.W.*—Improved cooking apparatus for large kitchens.

The exhibitors are manufacturers of first-class kitchen fittings and cooking apparatus, and hold the appointment of ironmongers to the Queen, and also to the principal London clubs.

THEY EXHIBIT THE FOLLOWING :—

1. THE LONDON ROASTING RANGE, of new construction, with cast-iron chimney-piece ; the back and sides composed of fire lumps ; one-half of the fire may be used without the other ; the bars are so constructed as to admit of being removed at any time without displacing the brickwork, and allowance is made for their expansion. This range gives out great heat with a small consumption of fuel, being very narrow from back to front.
2. AN IMPROVED SMOKE JACK, with double action outside movement, constructed to roast both horizontally and vertically ; with a newly invented lever apparatus for throwing the several movements in and out of gear.
3. A HOT PLATE AND BROILING STOVE, for stewing and grilling, having a large pastry oven at end, with improved sliding doors running upon gun-metal wheels. It has also a large hot closet under the oven, the whole being heated by one moderate fire at the broiling stove.
4. A STEAM BAIN-MARIE, and set of copper stewpans, soup-pots, &c. heated by steam, for keeping gravies, soups, sauces, &c. hot, without the slightest risk of their being burnt or spoilt.
5. A GAS STOVE for stewing, with newly invented burners, which produce a blue flame ; the gas being mixed with common air gives out great heat without smoke, and will not soil the cooking utensils placed over it.

An improved charcoal stove, formed of Stourbridge fire clay, in lieu of iron, as hitherto used, is placed behind the gas stove.

6. A LARGE HOT CLOSET, highly finished, with double-panelled door ; the shelves inside are made of wrought-iron, lap-welded by a new process, and will not crack, a fault to which the cast-iron shelves are always liable. They may be heated either by steam or hot water.

The above apparatus is suitable for a first-class kitchen, and is exhibited as a specimen of improved construction and superior workmanship.

[5970]

ADCOCK, RICHARD CASSWELL, 4 *Halkin Street West.*—Bolt for room or closet door, indicating engaged or disengaged.

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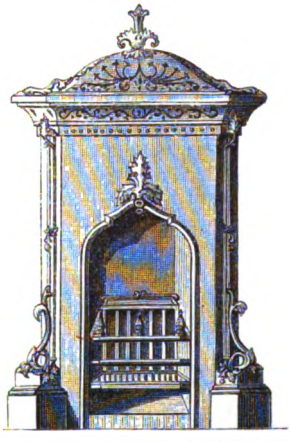
[5971]

ADDIS, WILLIAM, 6, 7, *and* 15 *Leicester Street, Leicester Square.*—Cundy's patent brick oven kitchen range; cottager's cooking stove; pedestal stove.



CUNDY'S PATENT PNEUMATIC WARM-AIR VENTILATING STOVE, for warming churches, halls, staircases, and public buildings.

For this invention Mr. Cundy received the Society of Arts medal, and also a medal at the International Exhibition of 1851.

This is the only patented stove the inside of which is entirely constructed of fire-clay tiles.

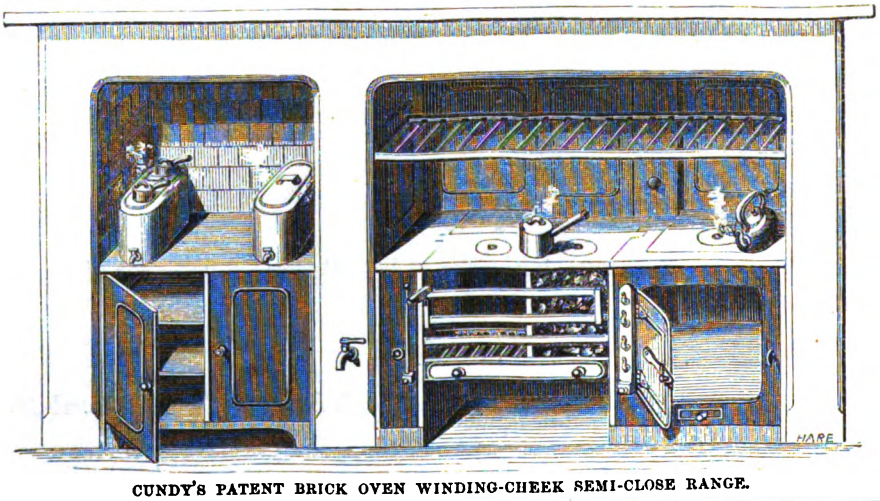
CUNDY'S PATENT BRICK OVEN WINDING-CHEEK OPEN FIRE AND SEMI-CLOSE RANGE.

4 ft. range from £13 to	£16 0
A larger class of range from £24 to . . .	30 0
Ditto, open fire, from £11 to	24 0

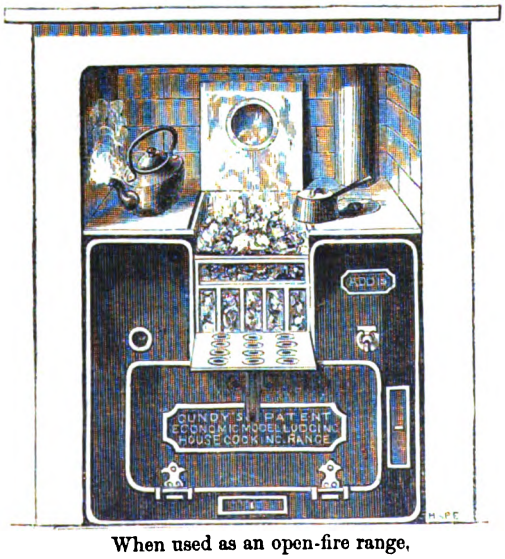
CUNDY'S PATENT ECONOMIC COTTAGER'S COOKING STOVE.

24 in.	£3 3
30 in.	4 4

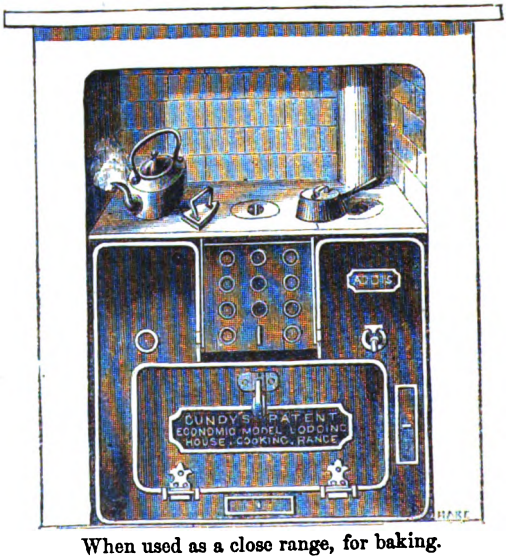
These goods are manufactured and sold by William Addis, wholesale ironmonger and stove-grate manufacturer.



CUNDY'S PATENT BRICK OVEN WINDING-CHEEK SEMI-CLOSE RANGE.



When used as an open-fire range,



When used as a close range, for baking.

CUNDY'S PATENT ECONOMIC COTTAGER'S COOKING STOVE.

The ranges can be seen in operation every day at the exhibitor's ware rooms. A prospectus will be forwarded on application to the above address.

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[5973]

ALLEN, THOMAS, *Clifton, and Hotwells, Bristol.*—Patent metallic tubular bedsteads for general use, military and portable.

PATENT METALLIC TUBULAR BEDSTEAD.

The advantages of the patent bedstead are:—

Its strength, being formed entirely of tubes and malleable iron.

Its durability and simplicity in construction. It can be put up and taken down in five minutes, without the use of tools of any kind.

It is guaranteed insect-proof.

Palliasses can be dispensed with; the sacking being equal to any spring mattress.

The prices vary from 30*s.* to £50.

TESTIMONIALS.

"*Chew Magna, June* 17, 1862.

"DEAR SIR,—I have seven of your patent tubular bedsteads, and have now had two years' experience of them, and I have much pleasure in adding my testimony to their general excellence, both as regards construction, material, and design. I have tried many other iron bedsteads, but I greatly prefer yours, being quite free from the common defect of working loose in the joints. The bedsteads I got from you are of various patterns, three are of what you term your "hospital pattern," and this is, from the moderate price, great strength, and very neat appearance for general purposes, in my opinion, the best bedstead out. I have also one of your camp bedsteads, to the excellence of which military men can better speak than I can, but I find it particularly useful to have in the house, as it is so very easily and quickly moved from one room to another, as occasion may require. Wishing you the success which I think you well deserve for having brought out a really good, useful article.

"I am, dear sir, yours faithfully,

"Mr. THOMAS ALLEN, "CONWAY L. ROSE.

"*Hotwell Road Iron Works, Bristol.*"

From MAJOR BUSH, 100th Regiment.

"*Gibraltar, June* 9, 1862.

"SIR,—Having now tried your patent portable iron bedsteads in use for three years, whilst serving in the West Indies, Mediterranean, and Aldershot, I have great pleasure in stating that in my own opinion (and that of several military officers who have seen it), your bedstead far surpasses anything of the kind in present use, owing to the facility with which it is put together and small space it occupies when taken to pieces, also its strength, comfort, and neat appearance.

"I have the honor to be your most obedient servant,

"H. S. BUSH,

"Mr. T. ALLEN." *Major, 100th Regiment.*

From W. BRUCE GINGELL, Esq. Architect, Bristol General Hospital.

"*Bristol, October* 26, 1856.

"DEAR SIR,—I beg to inform you that your patent tubular bedsteads were this day selected by the committee and faculty, as the best and most perfect submitted to them. I have no hesitation in stating that they must supersede the ordinary iron bedsteads, either for public institutions or for private houses.

"I am, dear sir, yours truly,

"Mr. T. ALLEN." "W. BRUCE GINGELL.

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[5974]

ASHWELL, JAMES CHARLES, 28 *Dorchester Street, Hoxton.*—Roasting jack without spring, the weight of meat the motive power.

[5975]

AVERY, W. & T., *Digbeth, Birmingham.*—Scales and weighing machines.

[5976]

BACKHOUSE, WILLIAM N., 46 *Westgate Street, Ipswich.*—The improved kitchen range; an economical ditto for cottages.

[5977]

BAILY, WILLIAM, & SONS, 71 *Gracechurch Street, E.C.*—Ornamental iron work, gates, staircase-work, stoves, &c.

[5978]

BAMBER, W. C., 12 *Little College Street, S.W.*—Mortise balance night bolt, and an improved night-latch.

[5979]

BARLOW, JAMES, 14 *King William Street, City.*—Patent cask tilt, no sediment disturbed; improved roasting-jack screen, &c.

[5980]

BARNARD, BISHOP, & BARNARDS, *Norwich.*—Park entrance gates in ornamental wrought-iron, designed by Thomas Jeckell.

This beautiful specimen of iron-work comprises a pair of principal gates and two side gates. The piers and lintels, with the griffins surmounting them, are of cast-iron. The tracery and panels of the gates and piers, with the foliage, &c. over the lintels, are of wrought-iron.

[5981]

BARRETT, R., & SON, *Beech Street, Barbican.*—Chimney-sweeping and drain machinery.

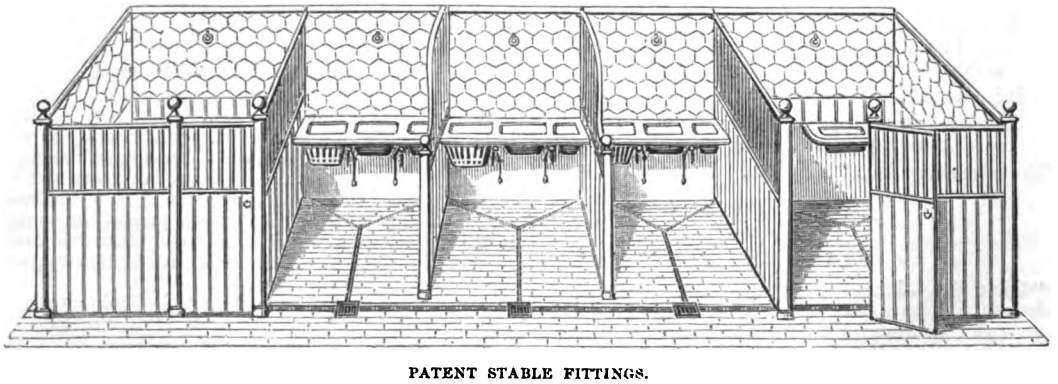
R. Barrett & Son are the only manufacturers of the patent chimney-sweeping and drain-cleaning machinery. The general adoption of these apparatus, and the satisfaction they have given, are sufficient guarantees of their excellence. The exhibitors execute all descriptions of metal castings, and are prepared to furnish estimates, upon application.

[5982]

BARTLETT, J., & SON, *Welsh Back, Bristol.*—Railway and road weighbridges and weighing machines for general purposes. (*See page* 5.)

[5983]

BARTON, JAMES, 370 *Oxford Street.*—Patent stable fittings and enamelled mangers; harness-room fittings.



PATENT STABLE FITTINGS.

BARTON'S PATENT STABLE FITTINGS, AND ENAMELLED MANGERS.

These superior-class stable fittings are patronised by the principal nobility, and adopted by many of the first architects and builders of the United Kingdom.

The above arrangement consists of three stalls and two loose boxes, fitted with improved ventilating divisions, patent enamelled fittings, and all the latest improvements.

A stable, newly erected, with full-sized stalls and loose boxes, may be seen at the manufactory, where an extensive assortment of stable fittings upon the most modern and improved principles, together with a large collection of harness-room fittings, for single and double harness, ladies' and gentlemen's riding saddles, brackets, &c. are also on view.

The exhibitor's new Exhibition Catalogue, containing numerous illustrations of the improved method of fitting up stables, will be forwarded on receipt of four postage stamps.

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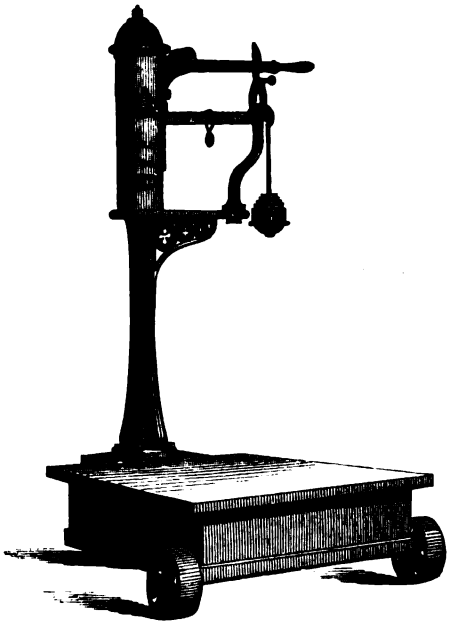
BARTLETT, J., & SON, *Welsh Back, Bristol.*—Railway and road weighbridges and weighing machines for general purposes.

LEVER WEIGHING MACHINE.



LEVER WEIGHING MACHINE.

WEIGHING MACHINE.

LEVER WEIGHING MACHINE to weigh from ¼ lb. to 1 ton £9 10 0

LEVER WEIGHING MACHINE with back iron, to weigh from ¼ lb. to 4 cwt. £3 10 0

LEVER WEIGHING MACHINE to weigh from ¼ lb. to 12 cwt. £6 5 0

LEVER WEIGHING MACHINE with dial indicator, to weigh 1 cwt. £6 0 0

WEIGHING MACHINE for equal weights . . £3 10 0

WEIGHING MACHINE fitted with chain and improved indicator.

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BENHAM & SONS, 19, 20, 21 *Wigmore Street, W.*—Ornamental metal work; stoves, fenders, kitchen fittings; patent cooking apparatus.

Obtained Prize Medal in Class 22, in 1851; Bronze Medal in Paris, 1855.

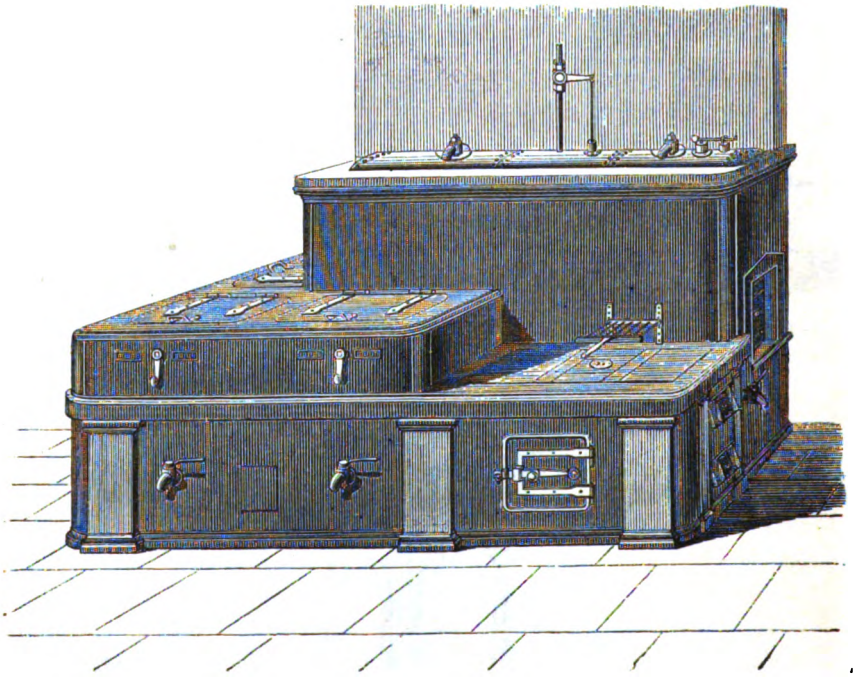
1. BENHAM'S PATENT COOKING APPARATUS for large establishments, schools, hospitals, workhouses, barracks, and ships.

It consists of a large brick roasting oven, in which also bread or pastry may be baked; a hot-water boiler, which also supplies steam for steaming vegetables, puddings, &c.; a second boiler for the supply of hot baths; two or more meat or soup boilers, a hot-plate and broiling stove, an iron pastry oven, and a hot closet for plates; the whole heated by one fire, burning about 200 lbs. of coal per day.

The special advantages of this apparatus are—

Remarkable economy of fuel;
Simplicity of management and perfect control;
Great external coolness.

It admits of various modifications of form, size, and arrangements, to suit the requirements of public or private establishments, and the varying positions of fireplaces



No. 1. PATENT COOKING APPARATUS.

and flues; but the following examples, amongst others, may be referred to in proof of its efficiency:—

NEW ROYAL MARINE INFIRMARY, Woolwich.
ROYAL MEDICAL BENEVOLENT COLLEGE, Epsom.
MESSRS. COOK, SON, & Co., St. Paul's Churchyard, London.
WEST LONDON UNION WORKHOUSE, West Street, Smithfield, London.
WAREHAM UNION WORKHOUSE, Dorset.
LEIGHTON BUZZARD UNION WORKHOUSE, Bedfordshire.
PENINSULAR & ORIENTAL STEAM NAVIGATION Co.'s STEAMER "Mooltan."
PENINSULAR & ORIENTAL STEAM NAVIGATION Co.'s STEAMER "Ripon." (2.)

It has also been adopted by the War Department at the following Barracks in consequence of the favourable report of the "Barrack and Hospital Improvement Commissioners:"—

ROYAL ARTILLERY BARRACKS, Woolwich. (2.)
WATERLOO BARRACKS, Tower of London.
PERMANENT BARRACKS, Aldershot.
EDINBURGH CASTLE BARRACKS.
STIRLING CASTLE BARRACKS.
GIBRALTAR BARRACKS. (2.)

2. RANGE, WITH OVEN, for married soldiers' quarters.

3. RANGE, WITH BOILER, for officers' servants' rooms.

These two ranges are fitted with hollow fire-lump backs, and louvred ventilators for the admission of warm air to the rooms. They are adopted by the War Department in all the new barrack buildings.

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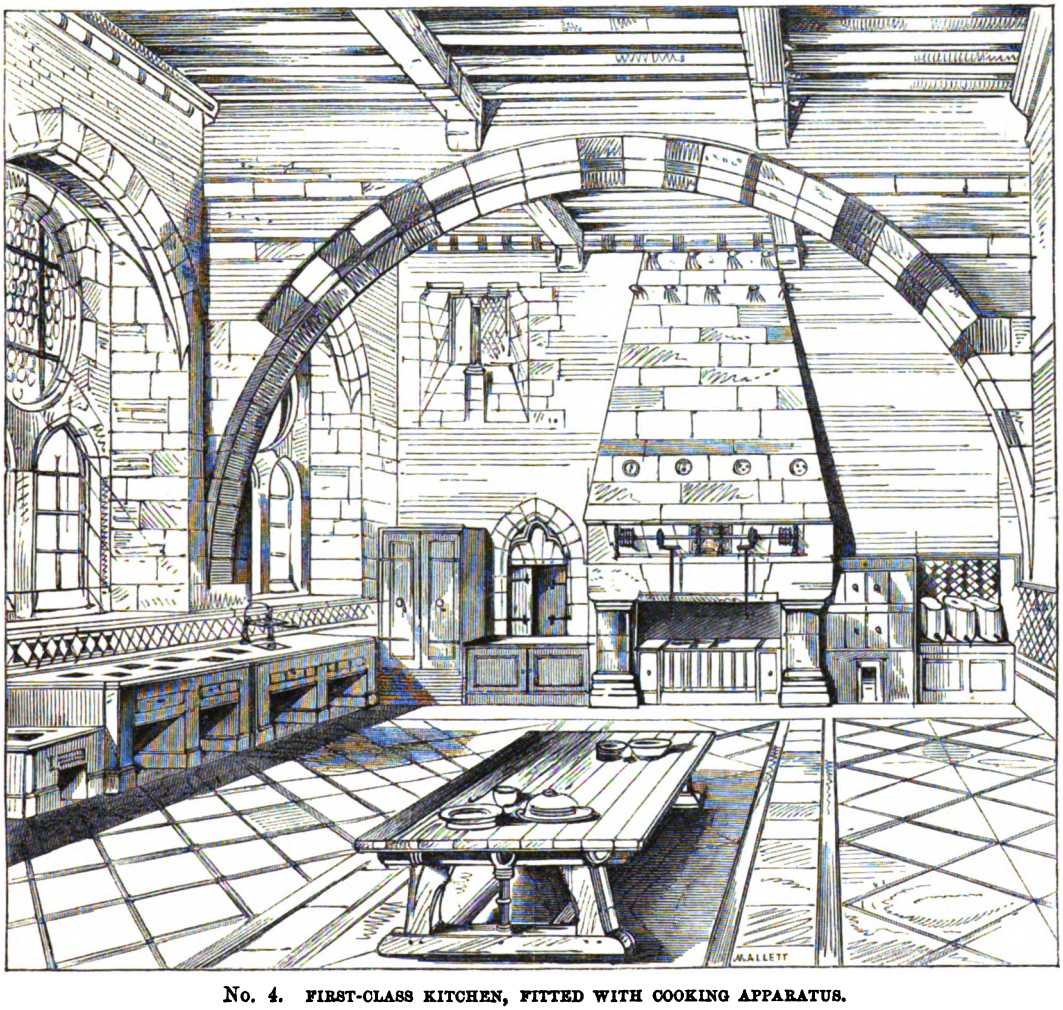
BENHAM & SONS, *continued.*

4. A FIRST-CLASS KITCHEN, with appropriate fittings, consisting of

The OXFORD ROASTING RANGE, the first specimen of which, in London, was introduced by Benham & Sons at the celebrated kitchen of the Reform Club, and which, with the whole of the cooking apparatus, was fitted up by them under the superintendence of the late M. Soyer.

It has an open fire, with vertical bars, but its peculiar excellence consists in the intense heat radiated from it, and its great economy of fuel—the space from the bars to the back being only one-half the usual depth. The back is formed of Stourbridge fire clay. The size of the fire may be increased or diminished at pleasure, and the whole of the front opens on hinges, like a gate, so as to give ready access for the removal of cinders, &c. The boiler for hot water is placed behind the back.



No. 4. FIRST-CLASS KITCHEN, FITTED WITH COOKING APPARATUS.

IMPROVED SMOKE JACK, with double movements, dangle-spits, and universal joints. The apparatus is kept in motion solely by the upward current of air in the chimney, without springs or weights.

STEWING STOVES AND STOCKPOT STOVE, heated by charcoal or gas, and therefore requiring no flue. The lower stove at the end is for large stockpots.

BAIN-MARIE PAN, for keeping sauces, soups, gravies, &c. always hot and ready for use without the slightest risk of burning or spoiling.

COOK'S SINK, with water for cooking purposes, &c. laid on.

HOT-PLATE AND BROILING STOVE, with movable gridiron, to which can be also added the oven on the top, as shown in the drawing, all heated by one fire.

HOT CLOSET, heated by steam or hot water, for keeping silver and china hot; also for receiving the different courses of a dinner after being dished up.

STEAM TABLE for dishing up.

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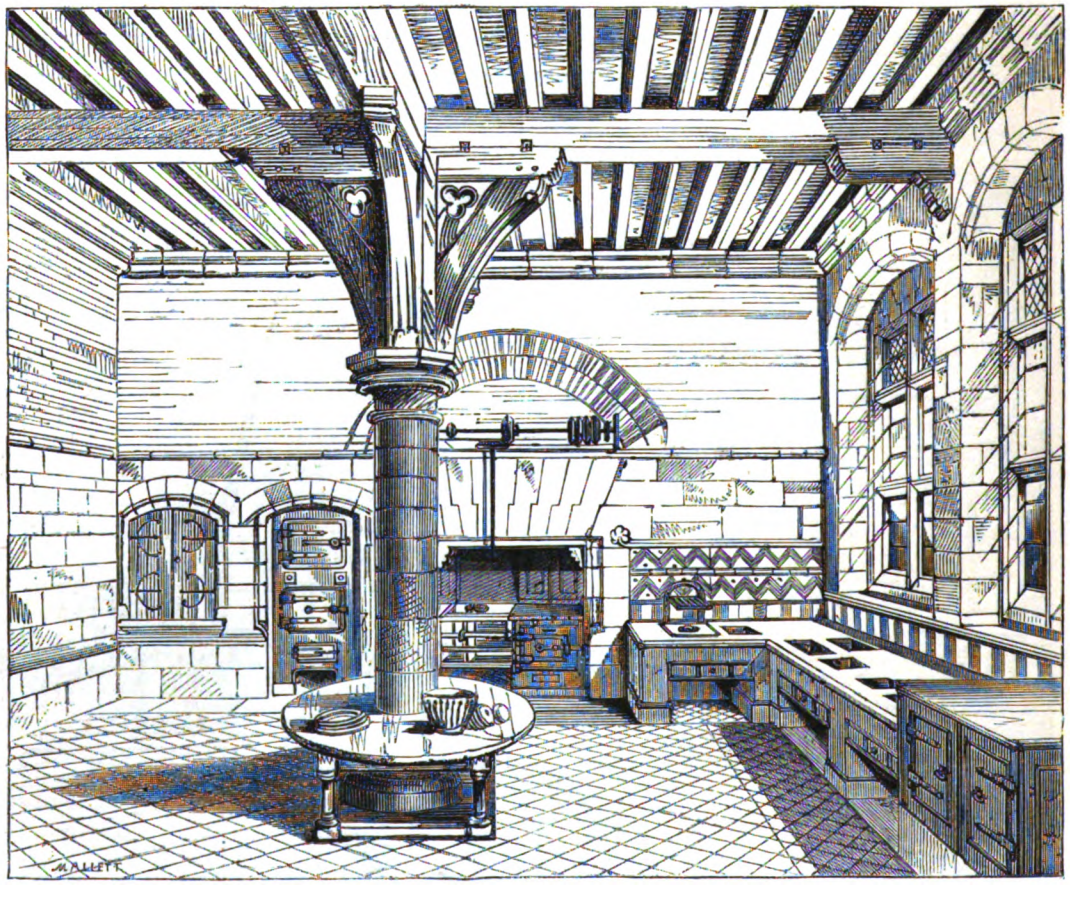
BENHAM & SONS, *continued.*

OVENS with a separate furnace underneath.

STEAM KETTLES, of copper or block tin, for boiling meat, vegetables, puddings, &c.

DINNER LIFT for conveying the dinner to the floor above. In large establishments, coals, &c. are carried up to the top of the building in this manner, which effects a great saving of labour.



No. 5. KITCHEN FITTED WITH COOKING APPARATUS.

5. The above engraving represents a very complete and efficient COOKING APPARATUS, which Benham & Sons can confidently recommend for London or country houses, although on a much smaller scale than that which is represented in the preceding engraving.

BENHAM & SONS' IMPROVED LONDON-PATTERN KITCHEN RANGE, with oven and boiler; all heated by one fire. The oven can be thoroughly depended upon for acting properly, and the boilers can be arranged to supply hot water for a bath, or for nursery and bedroom use (in addition to the kitchen), as well as to heat a hot closet and steam kettles, as represented in the engraving.

IMPROVED SMOKE JACK, with single movements, dangle-spit, and universal joint.

HOT-PLATE AND BROILING STOVE, with iron front and top, movable gridiron, &c.

STEWING STOVES, heated by charcoal or gas.

HOT CLOSET, heated by steam, for keeping silver and china hot and ready for use; also for receiving the different courses of a dinner after being dished up, and until taken to the dining room, without any possibility of their being scorched or dried up.

OVENS, with a separate furnace underneath.

STEAM KETTLES, for boiling meat, puddings, vegetables, &c.

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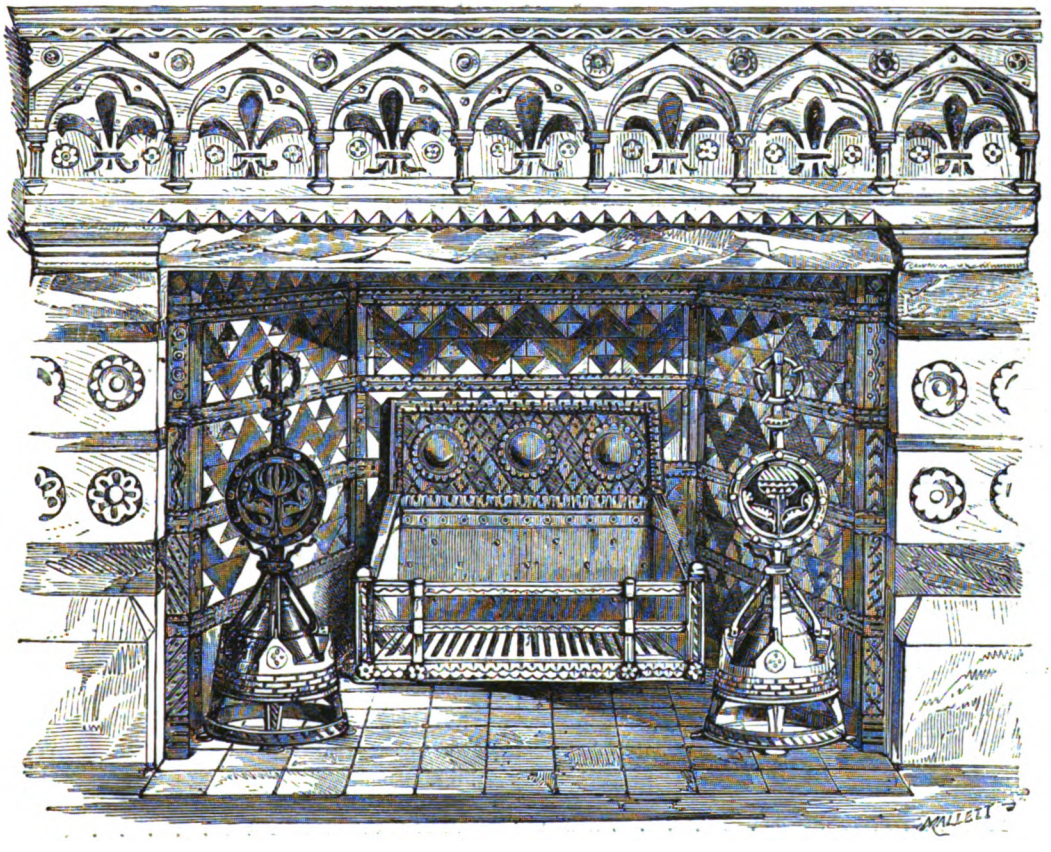
BENHAM & SONS, *continued.*

6, 7. TWO POLISHED STEEL DRAWING-ROOM STOVES, with ormolu and porcelain enrichments.

In the adjoining court are exhibited four specimens of Mr. John Billing's PATENT DOUBLE-DRAUGHT OPEN FIRE STOVES (for curing smoke, &c.) of which Benham & Sons are the sole manufacturers.



NO. 8. INDEPENDENT STOVE WITH DOGS.

8. The DOG STOVE represented above, and which is adapted either for coals or wood, is exhibited in the South East Transept in the Metropolitan Trophy for Class XXXI.

9. There are exhibited with it other specimens of mediæval metal work, in the style of the 12th and 13th centuries, designed and manufactured by Benham & Sons; amongst the rest—

A chancel screen of hammered iron-work.

A pair of rood-screen gates in hammered iron and brass.

A brass eagle lectern or reading desk.

A standard chancel light.

Various wall and bracket lights.

Communion plate in latten and electro-plate, &c.

A small collection of church plate manufactured by Benham & Sons from the designs of W. White, Esq. is exhibited in the Ecclesiological Court in Class 30.

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[5984]

BAYLISS, SIMPSON, & JONES, 43 *Fish Street Hill, Victoria Works, Wolverhampton.*—Chain cables, railway fastenings, iron hurdles, fencing, &c.

[5985]

BAYMAN, HENRY, 1 *Johnson Street, Old Gravel Lane, E.*—Double and single lifting jacks; set of iron blocks; improved ship's hearth and single winch.

[5986]

BENHAM & SONS, 19, 20, 21 *Wigmore Street, W.*—Ornamental metal work; stoves, fenders, kitchen fittings; patent cooking apparatus. (*See pages* 6 *to* 9.)

[5987]

BENNETT, WILLIAM, *Sir Thomas's Buildings and Sale Rooms, St. George's Place, Lime Street, Liverpool.*—Kitchen cooking ranges for coal and gas; smoke jacks; improved stoves and grates.

DR. ARNOTT'S SMOKELESS REGISTER GRATE, black finished, with patented improvements.

These grates will contain fuel for a whole day's consumption, are easily regulated, and well adapted for house and office purposes, and specially suited for chimneys with bad draughts.

Price of the one exhibited £11 0

DR. ARNOTT'S SMOKELESS REGISTER GRATE, best bright finished, with patented improvements, as above.

Price of the one exhibited £22 0

BENNETT'S SMOKE-CURER AND WARM-AIR GRATE.

These grates give an equal temperature throughout a room, perfect control over combustion, are very economical in use, and are manufactured to suit all classes of property.

Price of the one exhibited £12 0

BENNETT'S PATENT SMOKELESS STOVE, on Dr. Arnott's principles.

Price of the one exhibited £25 0

BENNETT'S LIVERPOOL KITCHEN RANGE, with modern improvements.

This range can be made in all sizes, and adapted to suit either large or small establishments. The boilers are constructed so as to heat baths, supply wash-houses, and for other domestic uses.

Price of the one exhibited £16 0

KING'S LIVERPOOL GAS-COOKING RANGES, made for cooking for from ten to five hundred persons.

These apparatus are most cleanly and economical in use, and perform all cooking operations in a superior manner.

Price of the one exhibited £10 10

[5988]

BERRY, GEORGE, 19 *Buttesland Street, N.*—Locks with crypted guards, not tentable by instrument or true key.

[5989]

BILLING, JOHN, *Westminster.*—Patented stove for more effectual combustion, and its regulation, and reducing smoke annoyances.

[5990]

BILLINGE, JAMES, *Ashton, near Wigan.*—Wrought-iron hinges, and locks of various sorts.

[5991]

BINKS, BROTHERS, *Millwall, Poplar.*—Round and flat wire ropes, conductors, fencing, strand sash line.

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[5992]

BISSELL, WILLIAM, *Union Street, Wolverhampton.*—Rim and mortise locks, upon improved equi-action principles.

[5993]

BLACKETT, FRANK W., 31 *West Smithfield, London.*—The inaccessible lock.

A lock for the protection of a safe or strong room should possess two conditions of security :

1. It must be so constructed that it cannot be charged with gunpowder so as to be blown off the door, it must also defy all attempts by picking either by keys or other instruments.

2. It must be so placed that it cannot be reached by boring or cutting holes through the door of the safe so as to be taken out.

A perfect lock should defy the skill of the scientific thief to pick it, and the violence of the burglar to destroy it. The so-called "unpickable" locks (not yet picked is all that can be said of the best), as though to vaunt their security and challenge attack, are placed on the door in front of the safe, where they afford the expert thief every chance of tampering and trying them with success. The best locks thus violate the first condition of security in spite of the ingenuity of their construction.

The second condition is still farther from being complied with. Thick iron doors with steel plates or pegs over the lock, or even doors made altogether of case-hardened iron afford no efficient security. These can be cut or bored through, the lock removed or destroyed, and the safe door opened.

Within the last two or three years a patent safe with inch doors had 3 in. holes put through it in one short summer's night. The exhibitor has drilled through a case-hardened door ⅝ in. thick with portable tools, laying bare the lock and so opening the door without noise in the short space of forty minutes.

It is not the construction so much as the position of locks that is faulty. Making clever locks and strong doors and then putting the locks in the most convenient place for attack, is like carefully corking and labelling a bottle "poison," and then leaving it within reach of everybody.

This patent proposes no alteration in the principle or construction of locks, but places them in such a position as to increase the security of all, even the best.

A slight examination will show that by this patent a lock secures the two conditions of security requisite in a safe. It is placed at the back of the safe, where it can neither be blown off nor cut out, and where the lock-picker has no chance to exert his skill. The lock, of any construction, is placed at the back of the safe, its bolt is hinged to a lever or levers in the lower casing of the safe. This lever has teeth at its front end, which when the bolt is shot by the key, rock upwards and fit into corresponding recesses along the whole width if necessary of the door of the safe, fastening it much in the same way as in an ordinary safe. Unlocking of course removes these teeth from the door.

The length of handle necessary for a key to reach the back of a safe would be very objectionable, but this has been removed. The only real or effectual part of a key is that which acts upon the works of the lock. The handle in this patent remains always in the lock and adds to its security. It is a fixture in the keyhole and can only be drawn out far enough to attach the true key to it. The lock is not only more difficult to pick from its distance from the keyhole, but all access to it is absolutely cut off as the sole entrance to it is permanently occupied by the handle of the key.

This handle might be dispensed with by complicated machinery for conveying the key to the lock, but it is preferred to exhibit the safe in its simplest construction.

The advantages offered by this patent are the following :

The lock being absolutely out of reach places every conceivable difficulty in the way of the lock-picker or burglar. The handle of the key being left at all times in the keyhole to prevent access to the lock, it may be made so strong as to turn with ease a lock so heavy, that if a picker attempted it, it would refuse to answer any trying or give any hint as to the principle of its construction.

The lock cannot be got at by boring or cutting. The only points of attack are the levers. The position of these cannot be ascertained, and those at the bottom of the safe, as well as the lock itself, are absolutely beyond attack, as the safe, either from its weight or from being fastened to the wall or floor from the inside, is immovable. Gunpowder if it could be introduced might blow off the casing of the lock and expend its force on the inside of the safe, but the levers would still hold the front of the door.

It does not interfere with the fire-proof principle of any safe, or the mechanical principle of its lock fastening.

The lock is secure from the action of the atmosphere. A simple and inexpensive lock might be used, which, two feet out of the reach of the picker, would be safer than the best in its present usual position.

All these advantages may be gained with a key so small as to be at all times, day and night, in the custody of its owner, with far less trouble and inconvenience than those now in use.

It is to be observed that all these advantages are not in exchange but absolutely in addition to those offered by the very best safe hitherto constructed.

[5994]

BLOOMER, CALEB, & CO., *Golds Hill, West Bromwich.*—Cable chains, common and patent anchors, and railway fastenings.

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[5995]

BOLTON, THOMAS, & SONS, *Birmingham, and Oakamoor, Staffordshire.*—Rolled metals, brass and copper wire and tubes, and calico rollers.

[5996]

BOOBBYER, JOSEPH HURST, 14 *Stanhope Street, Newcastle Street, Strand.*—Locks, furniture, bolts and hinges for buildings.

[5997]

BRACHER & GRIPPER, 11 *Cannon Street West, and Vulcan Safe Works, Skin Yard, Bankside, Southwark.*—Fireproof safes, doors, deed boxes, and other fireproof articles. (*See page* 13.)

[5998]

BRAMAH & CO., 124 *Piccadilly.*—Patent locks, iron safes, cash, jewel, and despatch boxes, with the lock applied.

[5999]

BRIERLEY & GEERING, *Birmingham.*—Specimens of iron ornamented with their patent enamel.

[6000]

BROWN, J., & CO., *Glasgow.*—Gill air warmers, hot air stoves, &c.

[6001]

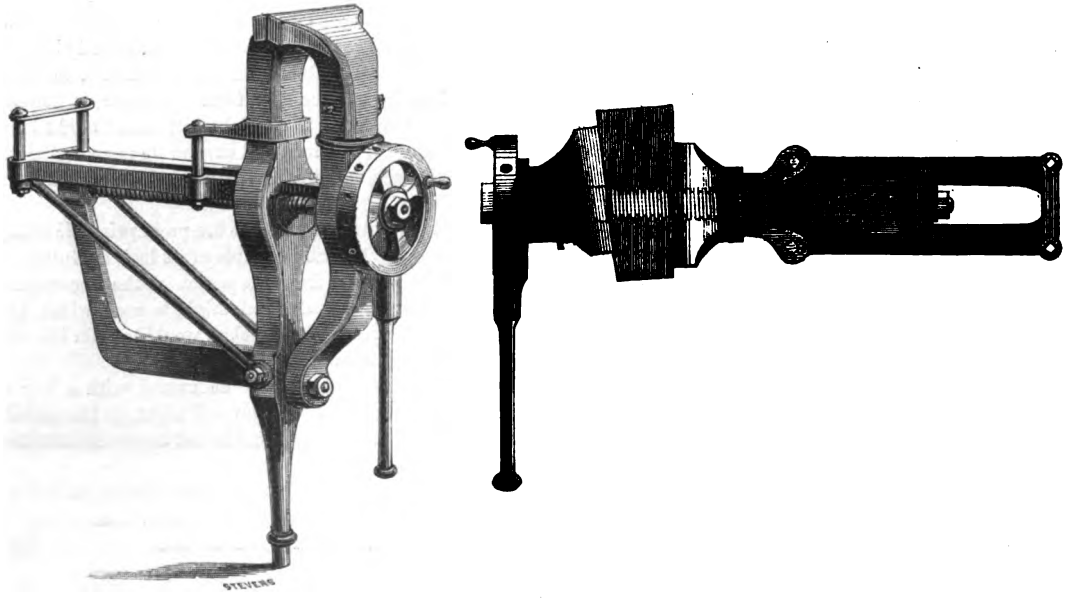
BROWN, BROTHERS, *Lyme Regis, and* 43 *Cranbourne Street, Leicester Square, London.*—Patent cooking ranges for mansions, villas, and cottages. (*See page* 16.)

[6002]

BROWN & GREEN, *George Street, Luton; London Warehouse,* 81 *Bishopsgate Street Within.*—Improved patent kitchen range for economising fuel, and cure of smoky chimneys. (*See pages* 14 *and* 15.)

[6003]

BROWN, LENOX, & CO., *Millwall, Poplar.*—Screw bench with panelled vice with adjusting jaw.



M. ROBERTS' PATENT PARALLEL VICE, with adjusting jaws fitted to vice bench, complete.

The advantages of this vice are—it will take in larger work than other vices, will adapt itself to taper work, and is quicker in action, being wound out or in by the wheel, and the lever used to give the nip or let it go.

Manufactured by Brown, Lenox, & Co. Millwall, Poplar, London.

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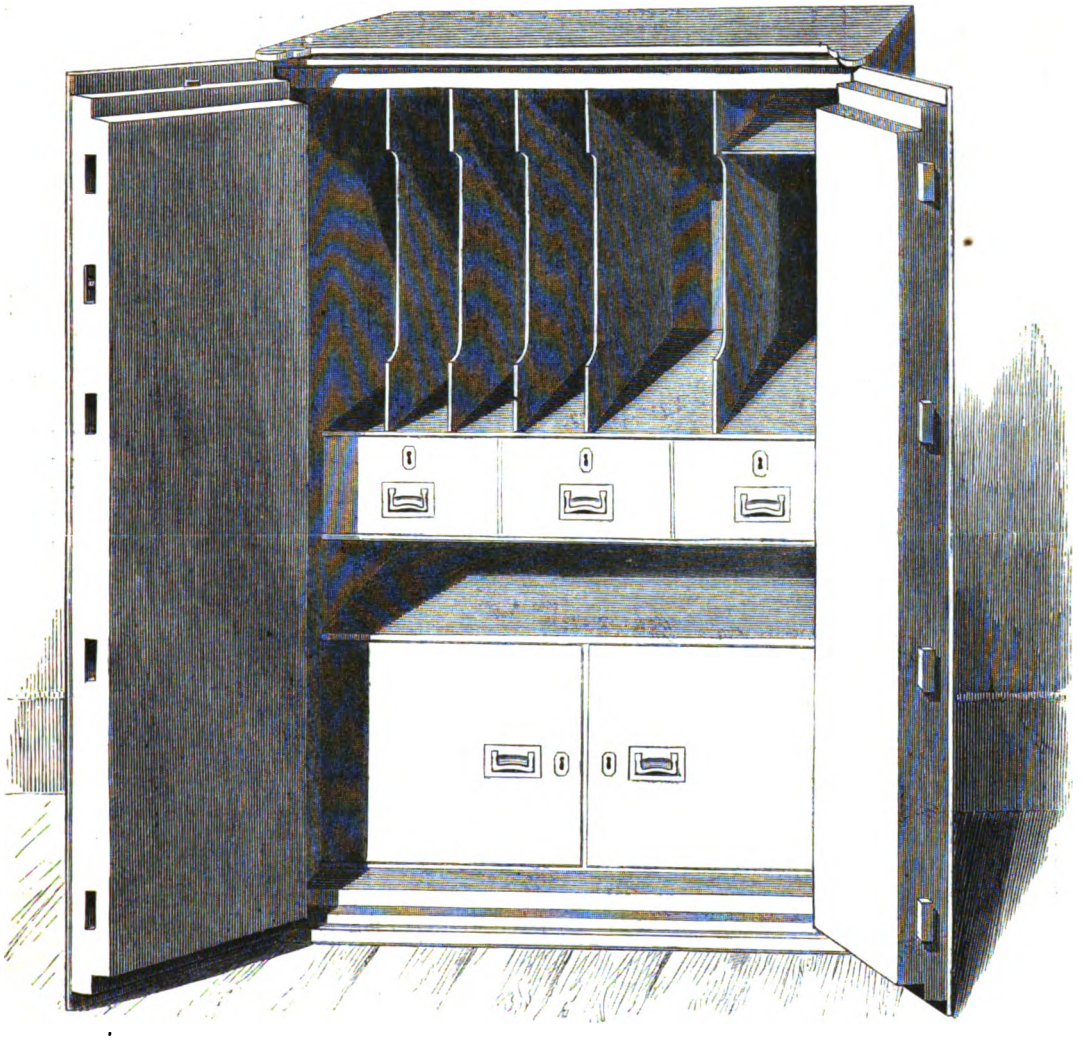
BRACHER & GRIPPER, 11 *Cannon Street West, and Vulcan Safe Works, Skin Yard, Bankside, Southwark.*—Fireproof safes, doors, deed boxes, and other fireproof articles.

Obtained a Prize Medal at the Exhibition of 1851.



FIREPROOF SAFE.

The exhibitors are inventors, patentees, and manufacturers of wrought-iron fire and thief proof safes, chests, doors, and strong rooms; patentees of the double-security detector locks for banks, treasure rooms, &c.; and makers of cash boxes, deed boxes, &c.

They have supplied the new Houses of Parliament, Her Majesty's honourable Board of Ordnance, the National Debt Office, &c.

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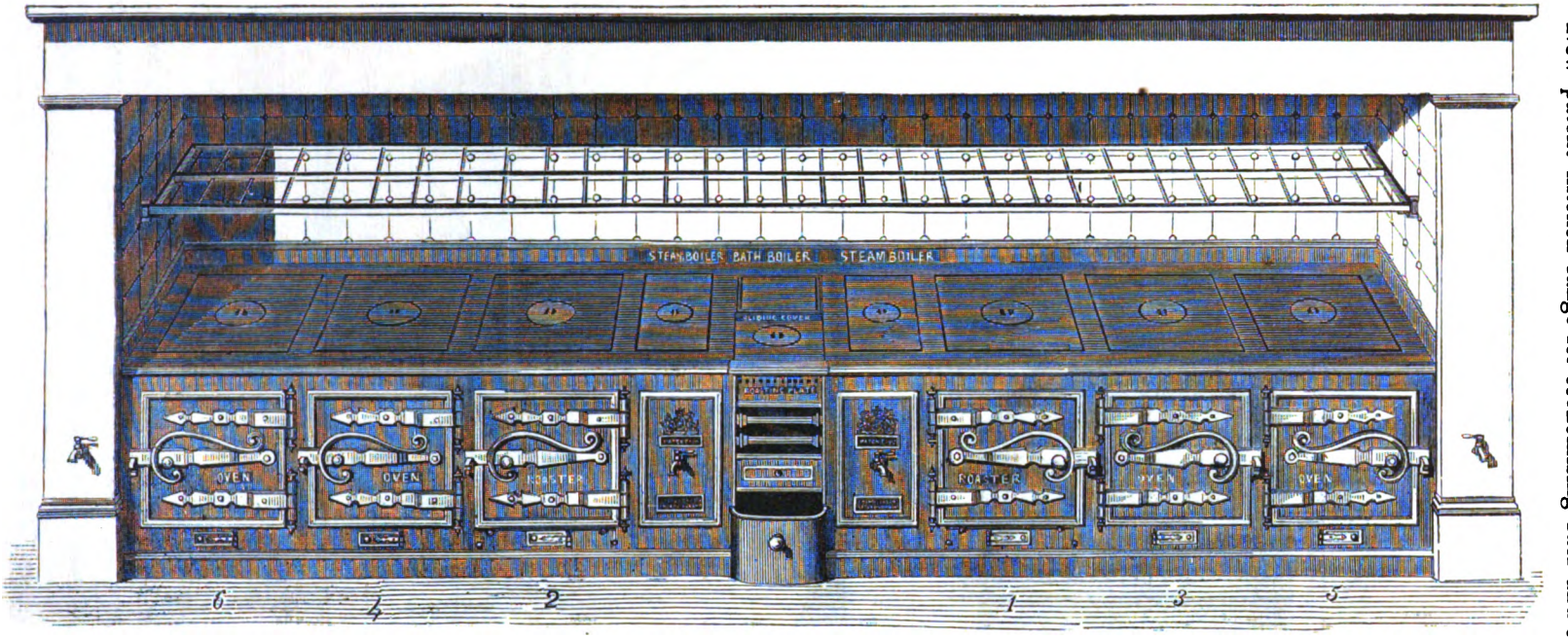
BROWN & GREEN, *George Street, Luton; London Warehouse*, 81 *Bishopsgate Street Within.*—New patent kitchen range for economising fuel and cure of smoky chimneys.



This range has been tested by order of the Government. The following is a copy of the official report:—

"Report of a trial of a cooking apparatus, manufactured by Messrs. Brown & Green.

"The apparatus is of the nature of a kitchener, with an open fire for roasting; it consists of 3 boilers and 6 ovens, with hot-water cistern. Two of the boilers, holding 44 gallons, are for steam; and the third, holding 18 gallons, is for hot water. The ovens are 2 ft. square; the range 18 ft. long. The trial, the particulars of which are subjoined, was exceedingly satisfactory:

	H. M.
The fire was lighted with 1 lb. of wood . . .	at 12 50
Ovens Nos. 1, 2, 3, and 4 attained 270 deg. Faht. in 35 min.	at 1 25
Ovens Nos. 5 and 6 attained 260 deg. Faht. in 59 min.	at 1 49
The steam boilers boiled in 38 min.	at 1 28
The hot-water cistern (25 gallons) boiled in 70 min.	at 2 0
One pint of water boiled on hot plate over fire in	7 min.
One ditto ditto ditto side boiler in	9 min.
One ditto ditto ditto No. 1 oven in	14 min.
One ditto ditto ditto No. 3 oven in	25 min.
One ditto ditto ditto No. 5 oven in	38 min.

	MEN
Ovens Nos. 1, 2, 3 and 4 will bake (meat with potatoes under it) for	1200
Ovens Nos. 5 and 6 ditto	400
The six boilers on hot plate will cook for . . .	360
Six stew pans ditto ditto . . .	120
The fire will roast three joints for	56
Total	2136

The steam boilers will steam potatoes for 1000 men.

The consumption of coal ("Inland," of inferior quality) was—

For the first hour	56 lbs.
For the second hour	30 lbs.
For the third hour . . . . . (nil)	
Total	86 lbs.

"*February* 18*th*, 1862.

(Signed) "G. WARRINER,

"*Instructor of Cookery to the Army.*"

Note.—The above report shows a consumption of only three-fifths of an ounce of coal per head. The whole of the apparatus remained in full action at the end of the third hour. The patentees are compelled to exhibit this range minus the two end ovens, not having a sufficient allotment of space for its entire length.

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BROWN & GREEN, *continued.*

This range is constructed on a new principle (patented January, 1862), which prevents the great waste of heat, and therefore of fuel, hitherto unavoidable in all ranges from which an abundant supply of hot water or steam is required.

The method in such ranges has uniformly been to place the ovens on each side of the fire, and the boilers at the back. The heating of the boilers has always been accomplished by a flue formed under them, and carried at once into the chimney; and as the hot draught from a fire will invariably take the shortest course, the effect of the above arrangement has been to cause a great and wasteful rush of heat under the boilers, directly into the chimney, instead of its being carried round the ovens. The boilers and ovens could not, therefore, be worked simultaneously without a very much larger fire than is needful in a range constructed upon the new principle. Moreover, the old plan, with all its wasteful expenditure of fuel, fails to heat the boilers effectually, whilst it so restricts their capacity and power that the supply of hot water and steam for baths, lavatories, hot closets, steamers, &c. is far too limited for the requirements of hotels and other large establishments.

By the new patent arrangement all these disadvantages are removed.

At the side of the fire is a boiler which projects forward under the hot plate to the front of the range, and forms the side of the fire-place; and beyond this boiler is placed one or more spacious ovens.

The heat from the top of the fire is carried over the top of the side boiler, between it and the hot plate, and is then passed completely round the ovens before it obtains an outlet into the chimney. From the bottom of the fire another distinct current of heat passes through an arched flue under the same boiler and is carried up on the other side, between it and the first oven, and, uniting with the draught from the top of the fire, is also passed entirely round the ovens before it can escape.

Where an apparatus of larger dimensions is required, the same arrangement is repeated on the opposite side of the fire; whilst at the back is placed another large boiler, the lower part of which projects forward into the middle of the fire, the under surface forming a half arch which corresponds with the arched flues under the side boilers, thus affording effectual means of heating it without any escape of hot air.

The position and shape of the boilers and direction of the flues, form peculiar and most important features in this invention. The boilers being surrounded by the full heat of the fire, become the most powerful, either for steaming, circulating hot water, or any other purpose that can be desired in a kitchen range; and as the whole of that heat is under entire control and may afterwards be carried round any or all of the ovens before passing into the chimney, the desired temperature is obtained in each.

This patent principle is applicable to ranges of every size, and its power is demonstrated by the large one on view at the International Exhibition, which was made eighteen feet in length, having six ovens and three boilers, all worked by a fire only fourteen inches wide, those ovens most distant from the fire being not merely hot closets, but effective ovens; a result never before obtained with any quantity of fuel. The patentees are compelled to exhibit it minus the two end ovens—not having a sufficient allotment of space for its entire length.

This range, in its full original size, has been put into practical operation, and every part of it has been found to work most efficiently. It has been fully tested on behalf of the Government by Mr. Warriner, Inspector of Cookery and Cooking Apparatus for the Army, whose report is annexed.

Brown & Green's patent ranges are a certain cure for smoky chimneys, and possess the following special advantages:—

1. The means of roasting meat perfectly in front of the fire at the same time that the oven or ovens, boilers and hot plate are kept in full action—the movable iron plate which encloses the upper half of the fire front, coming into immediate contact with the fuel, becomes red hot; thus that portion of the joint exposed to it is equally well roasted with the part acted upon by the oven fire below, whilst the use of the roasting plate secures a full heat over the top of the range and in the ovens. For these reasons it possesses decided advantages over the ordinary door, to open which, for the purpose of roasting, seriously lessens the temperature of the ovens and hot plate.
2. The roasting plate above mentioned is perforated with a row of small holes, through which a current of oxygen is directed over the fire, causing the combustion of a portion of the smoke, and diminishing the expenditure of fuel and the frequency of cleansing the flues. This plate can also be easily removed and a set of bars slipped in its place, by which means the fire is made entirely open in front when desired.
3. The ventilating arrangement in the upper part, which is simple, never requiring attention, removes that close heat and the smell of cooking which is complained of in other kitcheners.
4. The facility with which fresh fuel can be put on the fire—the sliding top of this range being more easy to manage than any other top plate, whilst it avoids needless lifting of covers on the part of the servants and the risk of breakage.
5. Whilst an average width of fire front is retained for the convenience of roasting, the depth of the fire from the bars to the back is very much less than usual, so that a furnace heat and consequent self-destruction of the range and much waste of fuel are avoided.

In the above important respects, Brown & Green's kitchen ranges differ from and surpass all others; in many other details also they are more convenient and complete. They are well adapted for private families, and the ovens are well ventilated, and perfect either as roasters, or for the baking of bread and pastry. The larger sizes, fitted with steaming and bath apparatus, hot closets, and other appliances, form the most complete appointment for clubs, hotels, public institutions, and other large establishments.

These ranges are made from 3 ft. to 24 ft. in width.

Prospectuses, prices, references, and designs may be had on application.

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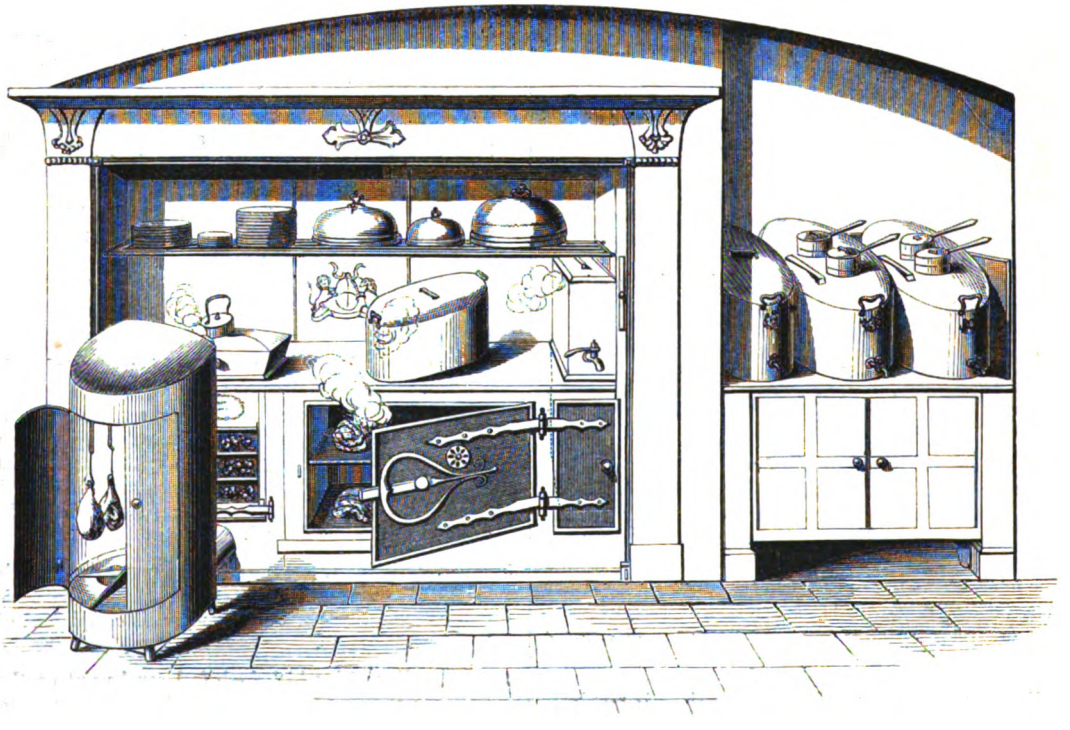
BROWN BROTHERS, *Lyme Regis, and* 43 *Cranbourne Street, Leicester Square, London.*—Patent cooking ranges for mansions, villas, and cottages.

BROWN BROTHERS' UNIVERSAL KITCHENERS.

The above-named kitcheners have justly obtained a world-wide celebrity for their ingenuity, safety, durability, elegance, and economy of fuel, time, and labour. Since receiving the prize medal at the Great Exhibition of 1851, and other certificates of merit from scientific and agricultural societies, many striking additions and improvements have been made, and these kitcheners, adapted to the use of the mansion or the cottage, are now so perfectly



UNIVERSAL KITCHENER.

arranged that by a single small fire every culinary operation can be effectually carried on at the same time, and while roasting, baking, broiling, stewing, steaming, frying, and boiling are being efficiently performed, hot water may be obtained in abundance for baths, heating conservatories, shops and offices of any description, and by an ingenious application linen may be aired without danger from smoke, fire, or dust. These kitcheners are so constructed that they can be fixed without difficulty, cannot be damaged by carelessness or neglect, and prove an infallible cure for smoky chimneys.

The automaton roaster supplied with the various sizes is an invention unique in itself, and by the application of a simple principle becomes the nearest approach to perpetual motion, and is used without the trouble and inconvenience of every other kind of roasting apparatus.

[6004]

BRYON, THOMAS, *Salop Street, Wolverhampton.*—A bedstead in the Elizabethan style, with improved sacking, registered.

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[6005]

BUIST, GEORGE, 70 *St. Mary's Wynd, Edinburgh.*—Lightning conductors, and metallic cords.

WIRE STRAND for fencing and signal cords.

Gauge of Strand.	Per cwt.	Gauge of Strand.	Per cwt.
0. . . .	£1 4 0	4	£1 8 0
1. . . .	1 5 6	5	1 9 6
2. . . .	1 6 0	6	1 12 6
3. . . .	1 7 0		

COPPER WIRE-ROPE LIGHTNING CONDUCTORS, ⅜ in. diam. and upwards, from 8*d.* per foot; with fittings, complete, from 10*d.* per foot.

COPPER AND GALVANIZED IRON CORDS for sash lines, greenhouses, turret clocks, &c.; galvanized cords from 6*s.* and copper cords from 10*s.* per 100 ft.

These cords, when put up with proper weights and pullies, are cheaper and more durable than any other material.

GALVANIZED METALLIC CORDS for clothes lines, from 4*s.* 6*d.* per 100 ft. and upwards.

GILT AND SILVER-PLATED PICTURE CORDS from 3*s.* per 100 ft.

STEEL WIRE CORD FOR CRINOLINES from 12*s.* per 100 ft.

Price lists and samples will be forwarded on application.

[6006]

BULLOCK, THOMAS, & SON, *Cliveland Street, Birmingham.*—Ivory, bone, wood, and horn buttons of every description.

[6007]

BURCHFIELD, T., & SON, 8 *West Smithfield.*—Chaff-cutting machines; oat-bruisers, and weighing machines.

[6008]

BURNEY & BELLAMY, *Millwall, Poplar, E.*—Iron tanks and cisterns; navy, house, and farm patent ventilators.

[6009]

BUTLER, J., & SONS, 4 *Elm Street, Gray's Inn Lane, W.C.*—Brass, copper, and iron wove wire.

[6010]

CARPENTER & TILDESLEY, *Somerford Works, Willenhall.*—Patent rim, hall door, dead mortise, and stock locks; curry combs, horse scrapers, &c.

[6011]

CARRINGTON, JAMES, 4 *Queen's Mews, Queen's Gate, Kensington.*—Model of a horse stall, and new system of bitting horses. (*See page* 18.)

[6012]

CARRON COMPANY, *Warehouses,* 15 *Upper Thames Street, London;* 30 *Red Cross Street, Liverpool; and* 123 *Buchanan Street, Glasgow; Works, Falkirk, N.B.*—Sugar pan, bright range, stoves, &c. (*See page* 19.)

[6013]

CASEY, W. F., 10 *Raven Row, Stepney, London.*—Models of scales and beam, complete, used for weighing of bullion.

[6014]

CHAMBERS, WILLIAM, *Oozell Street, Birmingham.*—Metallic bedstead, pillars and rails.

[6015]

CHATWOOD & DAWS, *Bow Street, Bolton.*—Patent locks, gunpowder escapement, bankers' safes for valuables and parchment documents.

[6016]

CHILLINGTON IRON COMPANY, THE, *Wolverhampton.*—Burden's patent machine-made improved horse shoes.

[6017]

CHUBB & SON, 57 *St. Paul's Churchyard.*—Patent detector locks, &c. (*See pages* 20 *and* 21.)

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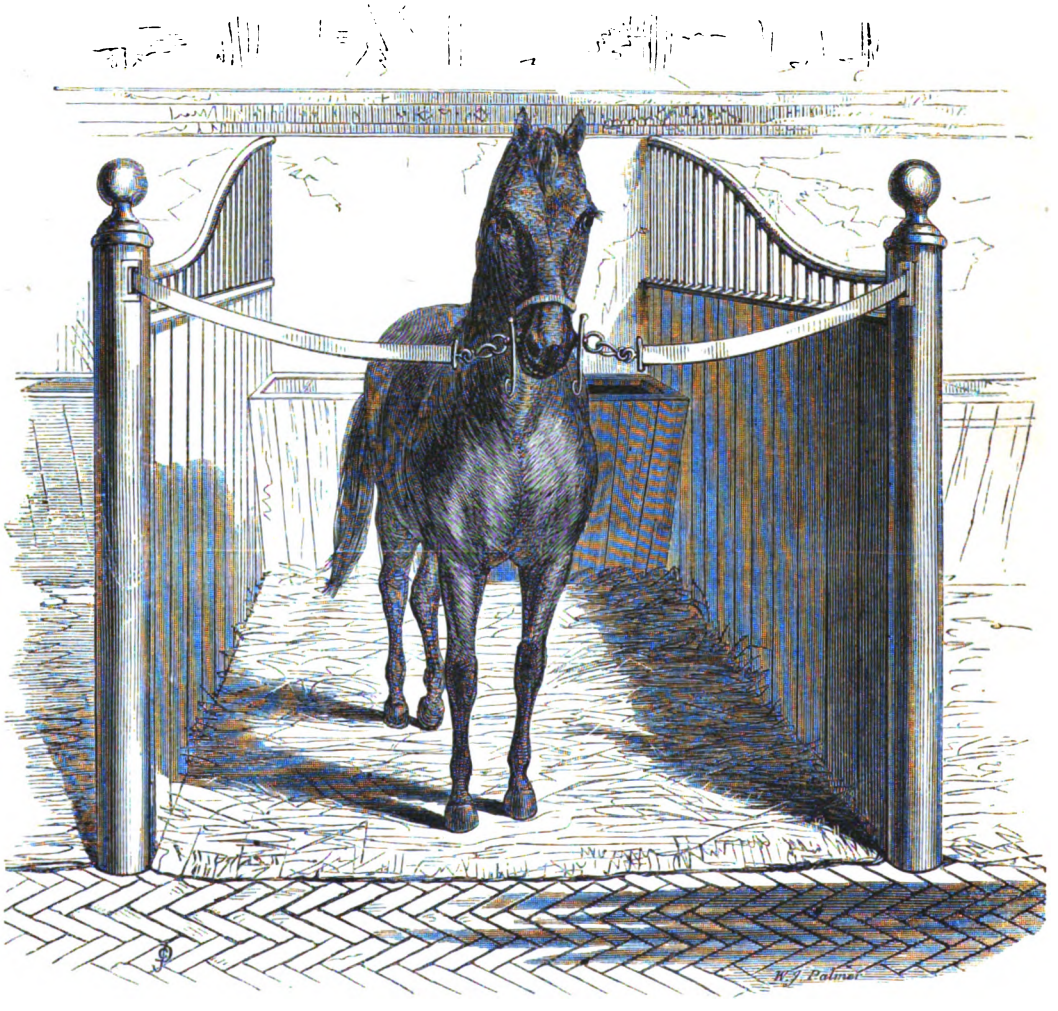
CARRINGTON, JAMES, 4 *Queen's Mews, Queen's Gate, Kensington.*—Improved horse stall, and new system of bitting horses.

The stall or box is removable without damaging either the stall, the box itself, or the building in which it is placed, the fittings not being a fixture. The horse cannot in any way injure himself. The fittings are also a preventive to the horse obtaining the habit of crib-biting. By the improved system of drainage introduced the stable is kept perfectly free from any ill effects of ammonia.



IMPROVED HORSE STALL.

These fittings also include a new system of bitting horses, whereby the horse makes his own mouth, and by so doing makes his own temper.

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CARRON COMPANY, *Carron Warehouses*, 15 *Upper Thames Street, London;* 30 *Red Cross Street, Liverpool;* *and* 123 *Buchanan Street, Glasgow;* *Works, Carron, N.B.*—Sugar pan, bright range, stoves, &c.

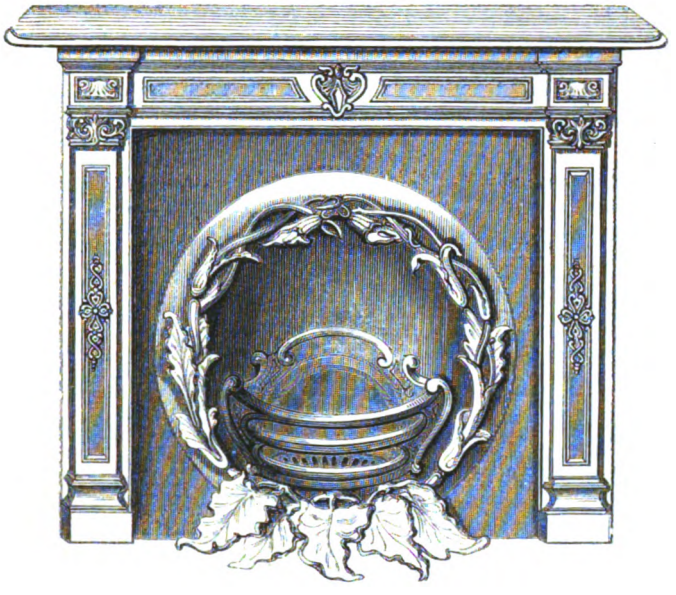

Fig. 1. PARLOUR REGISTER STOVE.

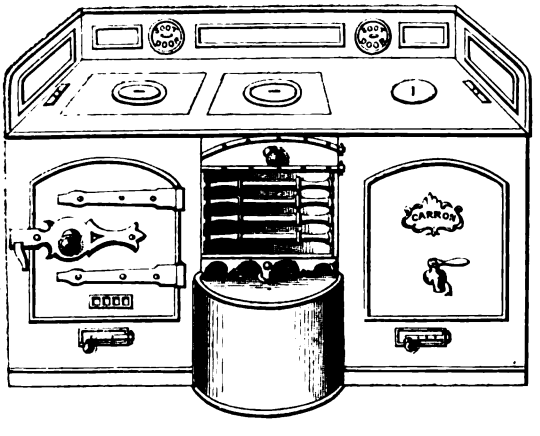

Fig. 2. KITCHEN RANGE.

1. A PARLOUR REGISTER STOVE, with fire-brick back, and cast-iron ornamental chimney-piece (fig. 1).
2. Various PARLOUR and other REGISTER STOVES.
3. KITCHEN RANGE, with bright fittings (fig. 2).
4. Large 350-gallon SUGAR PAN, best cast-iron.
5. SAND BOILER, 50 gallons. FB. POT, 60 gallons.
6. CABINET STOVE, with ASH PAN.
7. UMBRELLA STAND, and GARDEN CHAIRS.
8. BALCONY PANELS, different patterns.
9. NEWALS for iron balustrading, FLOWER-POT RAIL, &c.
10. SECTIONS of Carron Company's PIG IRON, showing fracture.
11. BOX BUSHES for colonial and other waggon axles.
12. Ornamental DOOR-PORTERS, SCRAPERS, &c.
13. SAD IRONS, various.
14. SUNDRIES, including cast-iron boot jacks, match and candle brackets, &c.

Fig. 1. shows register stove with fire-brick back, ornamental cast-iron chimney piece, and ash-pan complete.

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CHUBB & SON, 57 *St. Paul's Churchyard.*—Patent detector locks, fire-proof and thief-proof safes, strong-room doors.

Obtained a Prize Medal with "special approbation" at Great Exhibition in 1851, and First-Class Medal at Paris Exhibition in 1855.

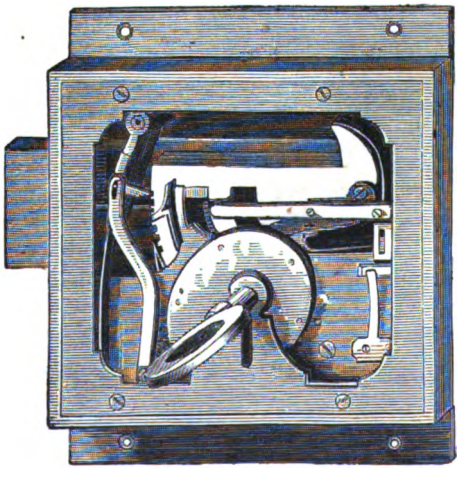
CHUBB'S PATENT DETECTOR LOCKS of various sizes, and for all purposes to which locks can be applied. An illustrated price list may be obtained gratis and post-free.

WHEEL LOCK for doors of strong rooms and safes, throwing any requisite number of bolts all round the door, the whole being secured by four gunpowder-proof locks, each with distinct key.

SUITE OF TWELVE MORTISE LOCKS for room doors, each having its own key opening that lock only, and with the following sub-master keys, viz.: One key to open Nos. 1 and 2 only, one key to open Nos. 1 to 3, one key to open Nos. 1 to 4, and so on up to one opening Nos. 1 to 12. Also a master key to open all, and to double-lock and thereby shut out any and all of the other keys.

DOOR LOCK in walnut-wood stock or casing, the ornamental front, as above engraved, being wrought from a single plate of steel, hardened and burnished.

LARGER DOOR LOCK, the case being of polished steel covered with an elaborate mediæval design in ormolu open work, and the key wrought in corresponding style.



CHUBB'S BANK LOCK for special security of iron safes and doors.

BANK OF ENGLAND LOCK, manufactured by Chubb & Son.

It will be observed that no locks of inferior quality are made by Chubb & Son. The whole of their locks sold to the public at large are exactly the same in security and excellence of workmanship as those supplied to Her Majesty, the Government offices, and other public establishments. The prices are from 10*s.* each upwards.

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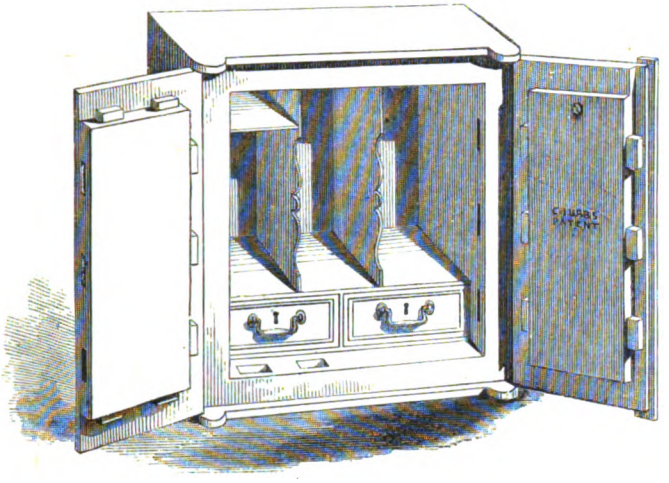
CHUBB & SON, *continued.*



CHUBB'S SAFE NO. 29. (See price list).

CHUBB'S PATENT JEWEL SAFE.

CHUBB'S PATENT WROUGHT-IRON FIRE-PROOF STEEL-PLATED SAFES AND STRONG ROOM DOORS, with gunpowder-proof locks.

1. JEWEL SAFE (see engraving) with ornamental door and sides.

The design on the door is executed in a mixture of dead and burnished steel, inlaid gilt scrolls in the corners, and ormolu mountings. The interior fitted up in ornamental wood, for the reception of jewellery. The door secured by Chubb's patent wheel lock throwing bolts all round.

2. Another JEWEL SAFE with folding doors of dead steel, with inlaid gilt scrolls and ormolu mouldings.

3. Very large BANKER'S SAFE, weighing about four tons, the interior fitted with drawers, cupboards, and partitions for books. The outer folding doors made of wrought-iron plates and hardened steel, combined in the most effective manner into a solid mass or plate. The doors secured by two gunpowder-proof wheel locks, throwing thirty-one bolts all round, and the main key-holes covered with case-hardened iron scutcheon locks opened by a small gold key set in a finger ring.

4. Another BANKER'S SAFE having the above-named system of combined iron and hard steel applied throughout its entire casing.

5. Specimens of Chubb's safes and chests of various dimensions, full particulars of which will be found in their complete illustrated price list, which will be forwarded gratis and post-free.

6. Wrought-iron fireproof doors and frames of various dimensions, for strong rooms.

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[6018]

CLARK, T. & C., & Co., *Wolverhampton.*—Enamelled and tinned cast-iron hollow ware, and general casting.

Fig. A.

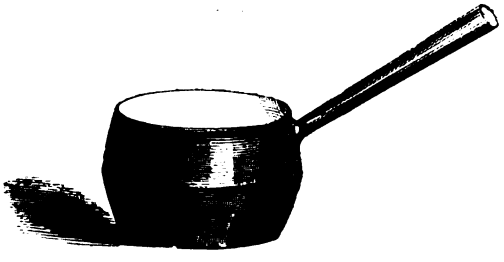

Fig. A. CAST-IRON SAUCEPAN lined either with enamel or tin.

Fig. F.

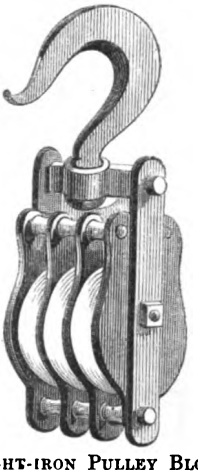

Fig. F. WROUGHT-IRON PULLEY BLOCK, with cast-brass or iron sheaves.

Fig. B. Fig. C. Fig. D.

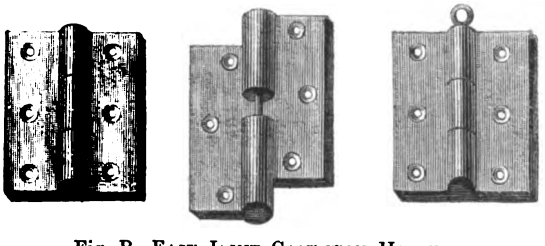

Fig. B. FAST JOINT CAST-IRON HINGE.
Fig. C. LOOSE JOINT ditto.
Fig. D. LOOSE PIN ditto.

Fig. G.

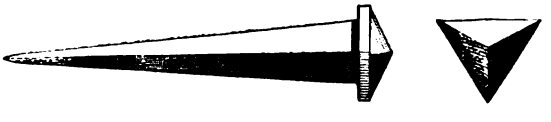

Fig. G. CARRON'S PATENT TRIANGULAR CAST-IRON WALL OR LATH NAIL.

Fig. H.

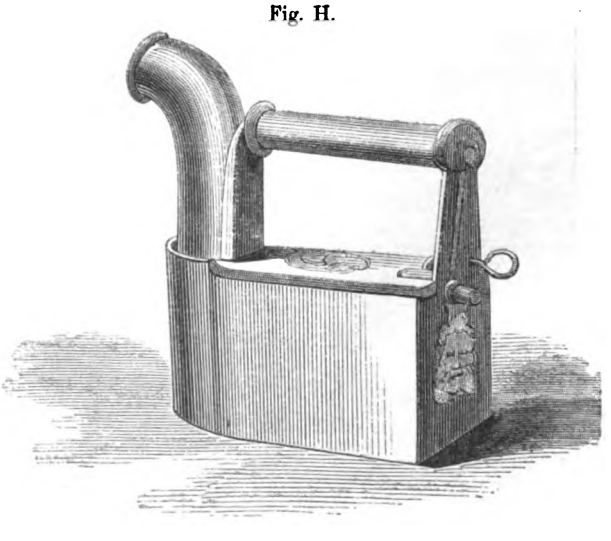

Fig. H. AMERICAN CHARCOAL BOX IRON.

Fig. E.

Fig. E. ENAMELLED CAST-IRON WASH-HAND BOWL, with plug hole.

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[6019]

COALBROOKDALE COMPANY, THE, *Coalbrookdale, Shropshire.*—Plain and ornamental ironwork.

[6020]

COLLINS & GREEN, 7 & 8 *Albion Place, Blackfriars.*—Sculpture and marble work, marble chimney-pieces, and stoves.

[6021]

COOLEY & FOWKE, *Castle Street, Wolverhampton.*—General hardware and saddlery.

[6022]

COOPER, G. B., 121 *Drury Lane.*—A new application of ornamental tomb railing.

[6023]

CORMELL, JOHN, *Lansdowne Iron Works, Cheltenham.*—Improved wrought-iron tanks, cisterns, and cattle troughs, coated inside.

[6024]

CORNFORTH, JOHN, *Berkley Street Mills, Birmingham.*—Steel and iron wire of all kinds, and all sorts of wire nails.

[6025]

COTTAM & Co., 2 *Winsley Street, London.*—Conservatory, stable fittings, verandah staircases, tomb railings, and ornamental iron work. (*See pages* 24 *to* 26.)

[6026]

COTTRILL, EDWIN, *Vittoria Street, Birmingham.*—Metallic stationery, copying, and embossing presses; dies, detector locks, &c.

[6027]

COX, SAMUEL, *Walsall.*—Every description of saddlers' ironmongery and harness mountings.

[6028]

CRICHLEY, HENRY, *Sheffield Place, Birmingham.*—Patent enamelled stove grates, mantel-pieces, hall stoves, hat stands, and fenders.

[6029]

DAVIES, EDWARD, *Galvanized Iron Works, Snow Hill, Wolverhampton.*—Galvanized corrugated iron roofing sheets; galvanized cisterns, scoops, buckets, patent pumps, water spouts, and models, &c.

[6030]

DAWBARN, ROBERT, *The Brink, Wisbech.*—Clamp for instantaneous stoppage of leaks in fire-engine and other flexible hose.

[6031]

DAY & MILLWARD, *Birmingham.*—Patent platform and registered weighing machines, scales, scale beams, steelyards, &c. (*See page* 27.)

[6032]

DEANE, EDWARD, 1 *Arthur Street East, London Bridge, E.C.*—Patent duplex range, patent steel ovens, patent steel boiler, patent roasting apparatus. (*See page* 28.)

[6033]

DEELEY, ABEL SMITH, 27 *Brasshouse Passage, Birmingham.*—Wrought-iron shoe heels and toe tips of every description.

[6034]

DEELEY, G. H., & Co., *Campbell Street, Dudley.*—Flat and round chains for mining and other purposes.

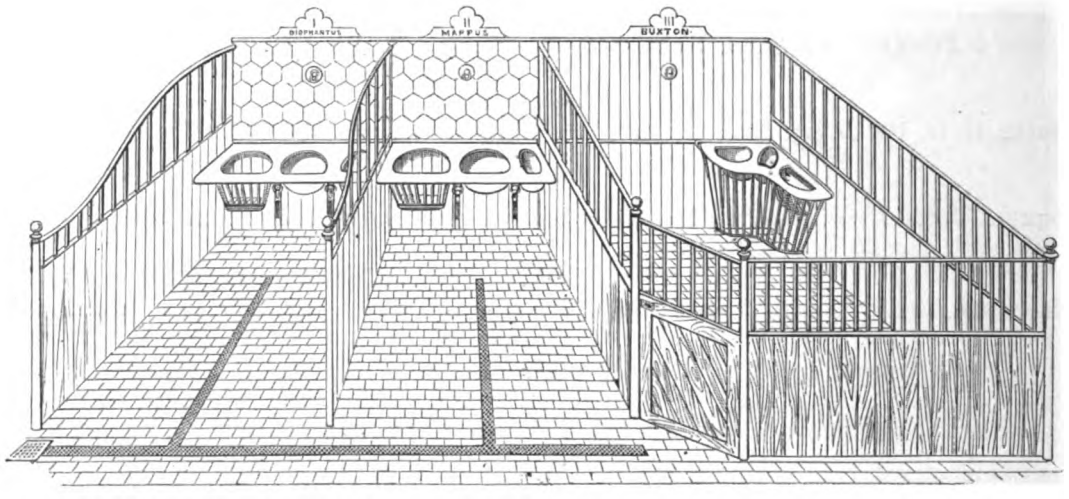
[6035]

DIXON, ADAM, *Birmingham.*—Knife and fork cleaners, twine or string boxes, and boot or shoe warmers.

Digitized by Google

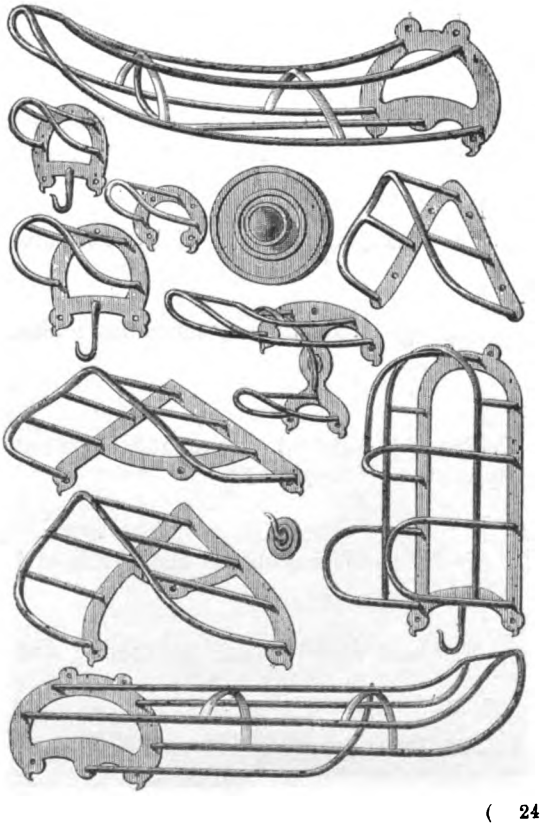
COTTAM & Co., 2 *Winsley Street, London.*—Conservatory, stable fittings, verandah staircases, tomb railings, and ornamental iron work.

MODEL OF STABLE FITTINGS, in two stalls and one loose box, to a scale of one-quarter the full size, showing the wainscot partitions and doors, wrought-iron ventilating division railing and ramps, with iron heel posts, surface gutter with movable safety covers, sanitary traps, improved registered rack, manger and water trough of enamelled iron, patent guide and halter strap with registered noiseless shackle combined, ventilating safety manger guard, enamelled head-stall plates, &c.



STABLE FITTINGS.

The improvements in these fittings are numerous, such as increased capacity, a better formation, no projections, the patent halter guide and noiseless swing manger shackle, patent portable seed box for saving the hay seeds for agricultural purposes, &c. drop cover for water trough, registered loose box ventilating guard to prevent the horse getting his head under the fittings, gutter to prevent the horse getting the caulkings of his shoes fixed, and numerous other additions.



WROUGHT-IRON VENTILATING BRACKETS, for hanging saddles and harness upon.

The improvements in these are their being made in sets and of the shape of the harness, which retains its natural form when suspended and preserves the leather from cracking; the openings between the bars allowing a free admission of air to dry the under parts of the saddle, collar, or harness pads.

SAMPLES OF WROUGHT-IRON CEILING HOOKS, for cleaning harness upon.

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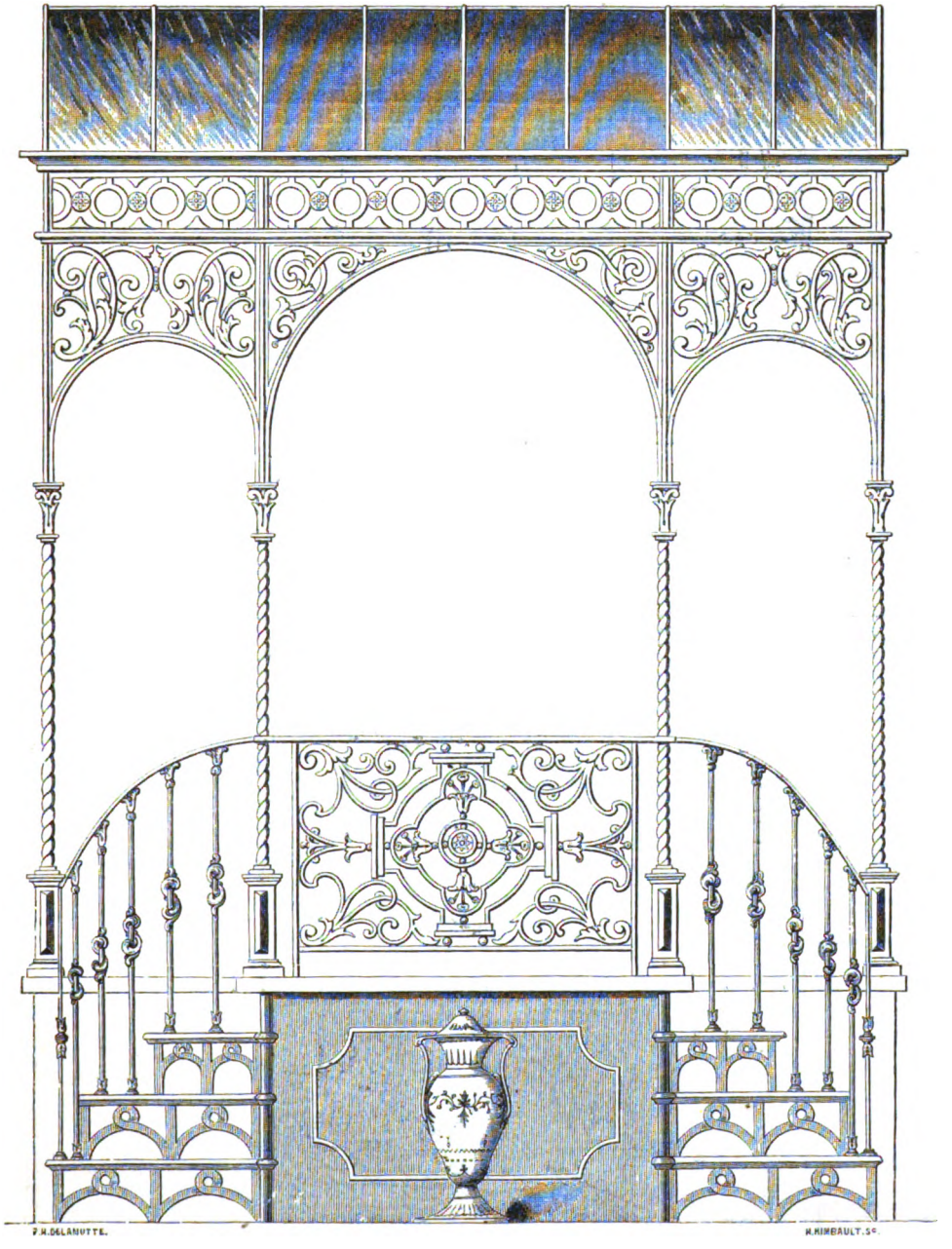
COTTAM & CO., *continued.*

SAMPLES OF IMPROVED RACK AND PILLAR CHAINS.

WROUGHT-IRON BRUSH DRAINER for drying the cleaning brushes, &c. after use.

AN IRON FORK RACK, to hang the stable fork upon when not in use.

SAMPLES OF SLIDING HEAD-STALL PLATES for the names of horses.



PORTION OF A VERANDAH.

A portion of a VERANDAH OR COVERED WAY; having cast-iron columns for the support of the roof, which may be covered either with zinc, copper, or glass; the spaces between the columns are filled in with ornamental spandrils, and a perforated frieze above.

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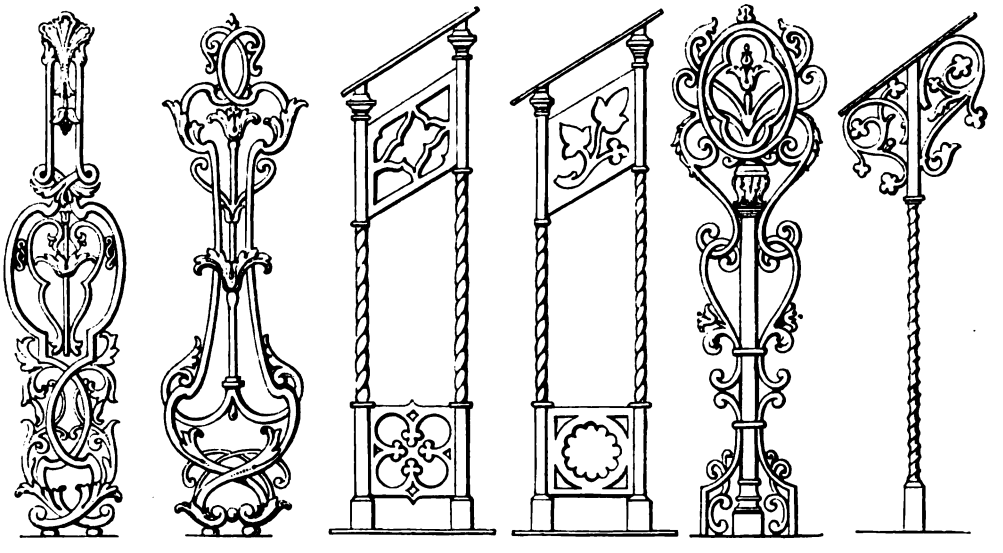
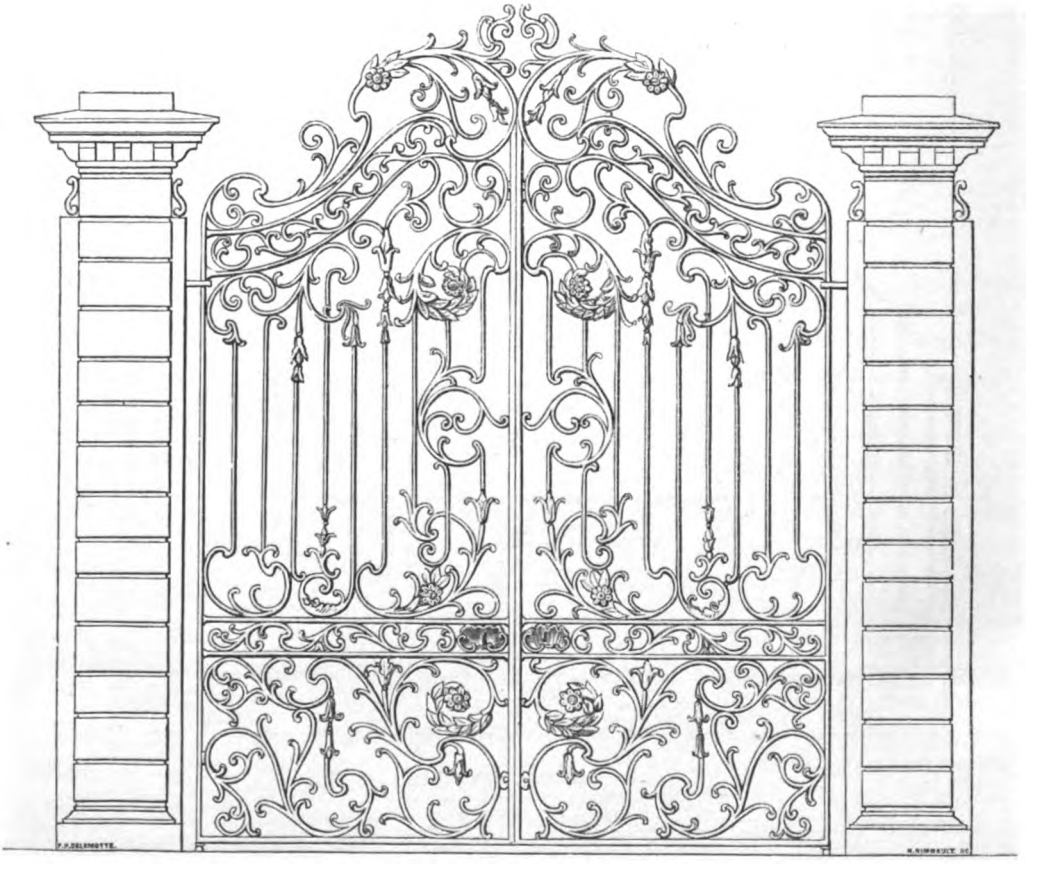
COTTAM & CO., *continued.*



CAST-IRON STEPS, straight and spiral, with iron railings of various designs. These stairs are suitable for the interior of buildings, also for external purposes, as into gardens from balconies, &c.

VARIOUS PATTERNS OF ORNAMENTAL BALUSTER BARS AND PANELS OF WROUGHT AND CAST IRON, applicable for stairs, galleries, communions, tombs, &c. also an example of a screen of wrought iron, grilles, lectern hinges, &c.



A PAIR OF GATES of Italian character, of wrought and cast iron, suitable for the entrance to a park, public building, and many other purposes.

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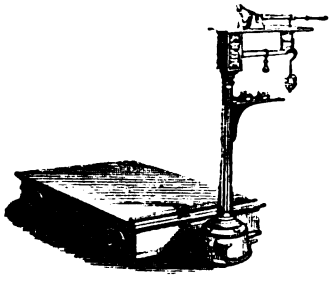
DAY & MILLWARD, *Birmingham.*—Prize metal patent and platform weighing machines, of all descriptions, also manufacturers of scales, scale beams, steelyards, &c.



WEIGHING MACHINE.

Sole patentees of the prize medal patent weighing machines, adapted for railway stations, 118, Suffolk Street, Gee Street, Birmingham.

WEIGHING MACHINE.

These machines may be graduated to the English or foreign standard.

[6036]

DOBSON, ELIZABETH & WILLIAM, 24 *Fieldgate Street, Whitechapel.*—Specimens of branding irons.

[6037]

DOCKER & ONIONS, *Thorp Street, Birmingham.*—Smiths' bellows, portable forges, anvils, vices, &c.

[6038]

DOLLAR, THOMAS AITKEN, 56 *New Bond Street.*—Improved methods of horse-shoeing.

[6039]

DOWLER, GEORGE, *Great Charles Street, Birmingham.*—Wax vestas and boxes; hearth brushes, inkstands, bells, corkscrews, toasting-forks, candle-shades, &c.

[6040]

DOWLING, EDWARD, 2 *Little Queen Street, Holborn.*—Scales, weights, and mills, and weigh-bridges of every description.

[6041]

DUGARD, WILLIAM, JUN., *Newton Street Works, Birmingham.*—Carriage and railway lamps, coach and harness furniture.

[6042]

DULEY & SONS, *Northampton.*—Kitchen ranges and patent bushes for axles.

[6043]

DYKE & CO., 15 *Aston Place, Holloway Road, N.*—Improved ice closet and chests.

These goods are made of any shape or size, and of the best materials. They afford a perfect safeguard against heat or dust.

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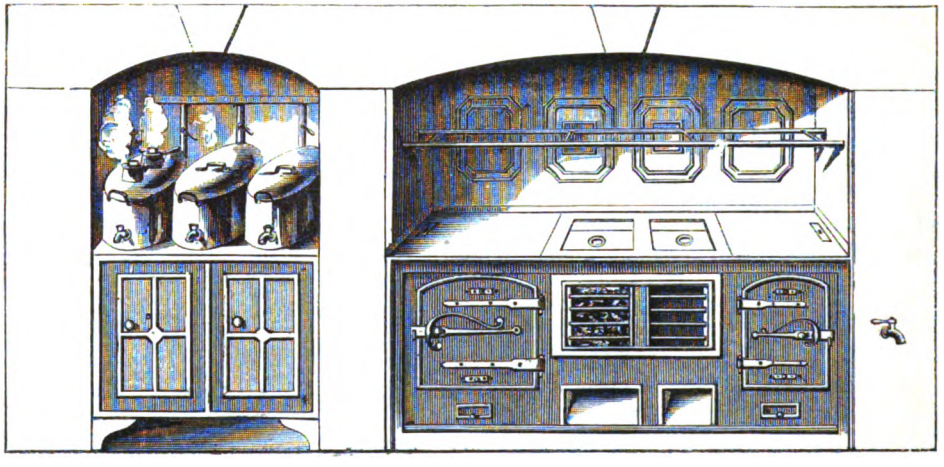
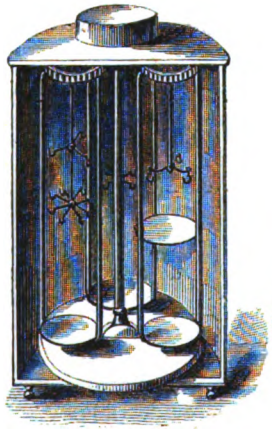
DEANE, EDWARD, 1 *Arthur Street East, London Bridge, E.C.*—Patent duplex range, patent steel ovens, patent steel boiler, patent roasting apparatus.

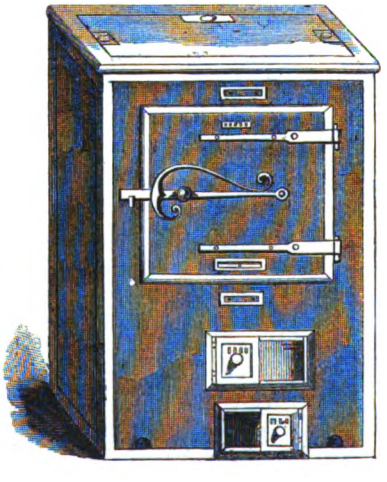


PATENT DUPLEX RANGE.

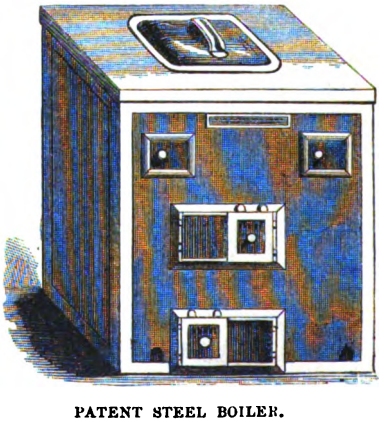
The PATENT DUPLEX RANGE is not surpassed by any range yet invented, in effectiveness and economy, having two fires which can be regulated to any size. One or both can be used, the boiler coming in the centre. A range of 6 ft. 6 in. long, with 24 in. opening admitting the boiler front, will, with the patent revolving roasting apparatus in front, roast with ease 12 joints.



PATENT REVOLVING ROASTING APPARATUS.



PATENT STEEL OVEN.



PATENT STEEL BOILER.

The PATENT REVOLVING ROASTING APPARATUS is intended to supersede the objectionable smoke and bottle jack, made in various sizes.

The PATENT STEEL OVENS are made for Government for baking for 50, 100, and 250 men, lined with fire clay.

The PATENT STEEL BOILERS are lined with very peculiar fire clay; and with only 9 lbs. of coals they have boiled 20 gallons of water for breakfast, 20 gallons of soup for dinner, and 20 gallons of water for tea, thereby providing for 75 men.

Testimonials sent.

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[6044]

EASTHOPE, WILLIAM, *Wyle Cop, Shrewsbury.*—Cooking apparatus, with open boiler for bath.

[6045]

EDELSTEN & WILLIAMS, *Newhall Works, George Street, Birmingham.*—Iron wire, pearl buttons, patent toilet and entomological solid-headed pins.

Edelsten & Williams (late D. F. Tayler & Co.) are manufacturers of iron wire, pearl buttons, patent toilet and entomological solid-headed pins, by special appointment to Her Majesty the Queen.

[6046]

EDGE & SON, *Coalport, Ironbridge, Shropshire.*—Flat gatten chains, cables, wire ropes.

[6047]

EDWARDS, ELIEZER, *Birmingham.*—Glass finger plates, lock furniture, drawer handles, bell pulls, &c., with metal mountings.

Obtained Honourable Mention at the Exhibition of 1851.

Finger plates, lock handles, key-hole plates, bell pulls, &c. *en suite*, in various styles and colours.

Drawer handles with screws complete formed entirely of glass.

Drawer handles, cupboard-turns, &c. with the iron shank firmly embedded in the glass while in a molten state.

Any of these articles can be adapted to the special requirements of foreign markets.

[6048]

EDWARDS, FREDERICK, & SON, 49 *Great Marlborough Street, London, W.*—Porcelain-tile grates, fire-brick grates, improved kitcheners. (*See page* 30.)

[6049]

EDWARDS, WILLIAM, 84 *Wellington Road, Edgbaston, Birmingham.*—Crinoline fire-protectors.

[6050]

ELIOT, EDWARD J., C.E., 7 *Southampton Row, Russell Square.*—An improved cooking apparatus.

[6051]

ELLIOTT, JOHN, 67 *Division Street, Sheffield.*—Quadrant weighing machines, adapted to English and French weights.

[6052]

ELLIOTT'S PATENT SHEATHING AND METAL COMPANY, *Newhall, Birmingham.*—Rolled metals, wire, bolts, spikes, nails, &c.

[6053]

ELLIS, ELIZABETH, *Perseverance Works, Sheffield.*—White metal buttons.

[6054]

ELLIS, G. H., *Grantham, Lincolnshire.*—Boot, knife, and fork cleaners; self-acting game, rat, and mouse traps; washing machines, &c.

[6055]

EVANS, GEORGE, 27 *St. Paul's Street, Walsall.*—Fine welded dog-chains and collars, links, Albert chains, &c.

[6056]

EVANS, JEREMIAH, SON, & CO., 33 *and* 34 *King William Street, London Bridge, E.C.*—Stoves, cooking apparatus, and lamps. (*See page* 32.)

[6057]

EYLAND, MOSES, & SONS, *Walsall.*—Spectacles and eye-glasses of every description, buckles for braces, belts, &c.

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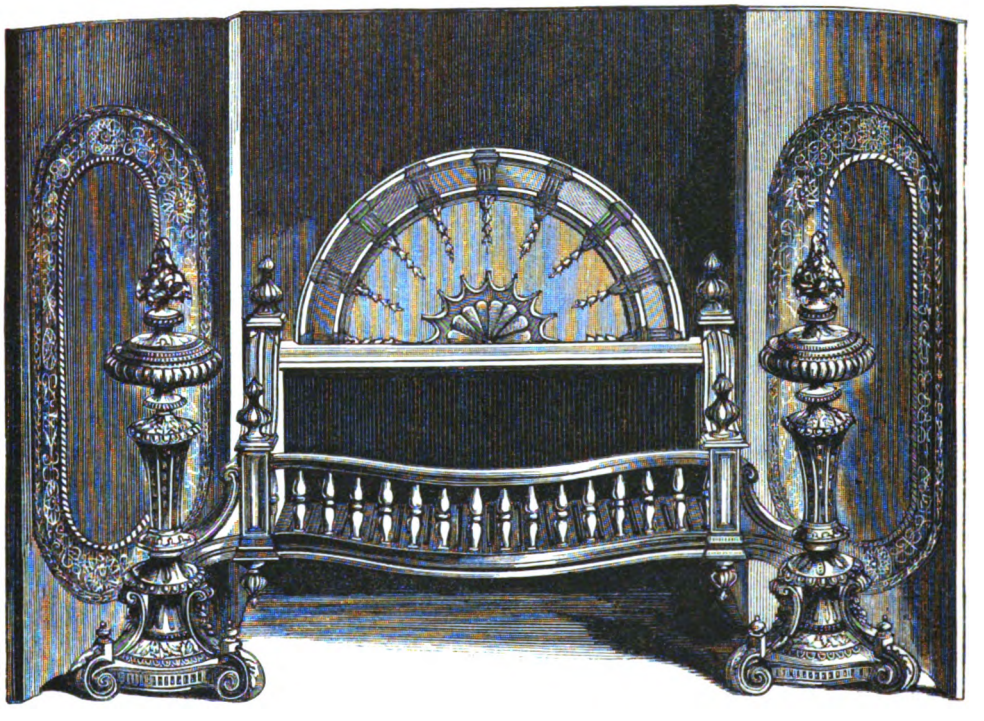
EDWARDS, FREDERICK, & SON, 49 *Great Marlborough Street, London, W.*—Porcelain-tile grates, fire-brick grates, improved kitcheners.



DRAWING-ROOM DOG GRATE, No. 7.

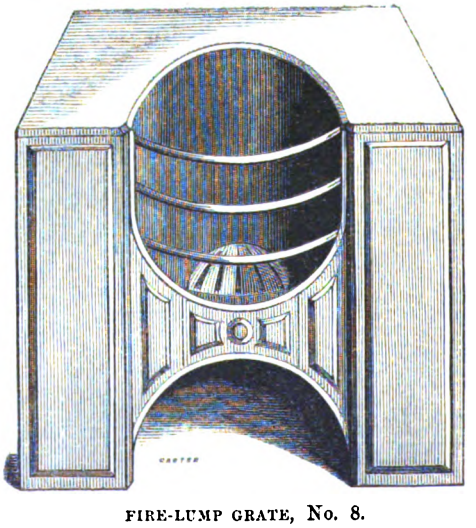
All the grates exhibited are of Edwards & Son's own manufacture and design. Most of these are ornamented with porcelain tiles and slabs, which have been made to Edwards & Son's designs by Mr. W. T. Copeland and Messrs. Minton & Co.

1. A LARGE GOTHIC HALL GRATE, with ormolu mouldings and handsome porcelain slabs.
2. A GOTHIC DRAWING-ROOM GRATE in polished steel, with ormolu mouldings and porcelain slabs.
3. A LIBRARY GRATE, with polished steel front and electro-bronzed Grecian mouldings; the porcelain slabs of Grecian design.
4. A BOUDOIR GRATE AND FENDER in polished steel, with ormolu mouldings and richly decorated porcelain slabs.
5. A CIRCULAR DINING-ROOM GRATE, with richly chased ormolu mouldings and porcelain slabs of Italian design.
6. A PEDESTAL HALL STOVE in polished iron, and richly ornamented with ormolu mouldings and electro-bronzed panels and ornaments. The design on the large panels is symbolical of heat. The chained figures in the lower part are intended to represent the subjection of fire to the intelligence of man. Two cherubs are shown above, nestling in foliage and enjoying the genial warmth of a vase of burning fuel. The centre of the top of the stove represents the sun. Around are figures and flowers representing the four seasons.
7. A RICHLY-DECORATED DRAWING-ROOM DOG GRATE, with fender and fire irons; the dogs and fender in ormolu, electro-gilt, and chased by gold chasers; the sides of the grate in polished steel, with porcelain tiles in white and gold, and electro-gilt ormolu mouldings.

8, 9, 10. FIRE-LUMP GRATES in one piece, made in three sizes, the fire bars of wrought-iron. These grates give a large amount of heat with a small consumption of coal, and are of very moderate price.

11. A PEDESTAL HALL STOVE in polished iron, with ormolu mouldings and porcelain panels.
12. A GOTHIC DOG GRATE, with porcelain panels at sides, and a porcelain tile hearth with fender.
13. A GRATE on the smoke-consuming principle, with porcelain slabs.

14, 15. DRAWING-ROOM GRATES, with ormolu mouldings and decorated porcelain slabs.



FIRE-LUMP GRATE, No. 8.

16, 17, 18, 19. GRATES of an inexpensive character, with porcelain tiles, ormolu mouldings, and fire-lump backs.

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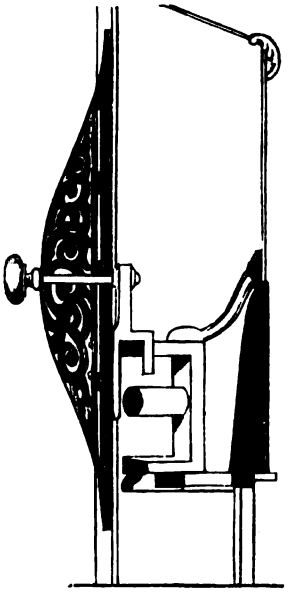
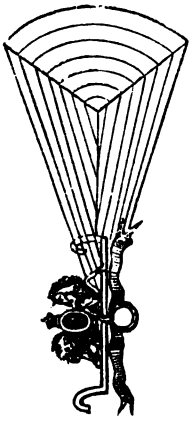
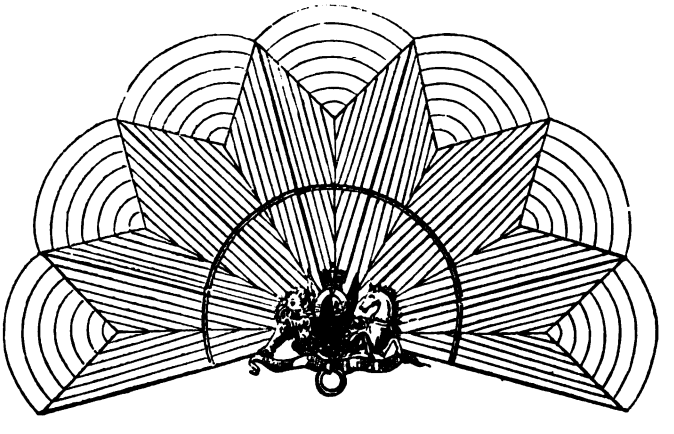
EDWARDS, WILLIAM, 24 *Wellington Road, Edgbaston, Birmingham.*—Patent improved fire-screens or guards.



These guards are ornamental in appearance, simple in construction, and will fold or spread out with as much ease as a lady's fan. Are made in any metal, adapted for grates of all shapes and sizes, do not interfere with the cheerful appearance of the fire or the diffusion of heat in the room, do not require to be removed from the grate when the fire is wanted or needs replenishing with fuel. By simply turning the handle in front, the guard can be folded leaf over leaf into the space of one, and so give free access to the fire.



FIRE GUARD, CLOSED.



FIRE GUARD, OPEN.

Licensed manufacturers—

William Burgess, Holloway Head, Birmingham.

Henry Crichley, Coventry Road, Birmingham.

Samuel Robotham, Bradford St. Birmingham (in wire).

William Soutter, New Market Street, Birmingham.

Drawings with prices will be forwarded on application.

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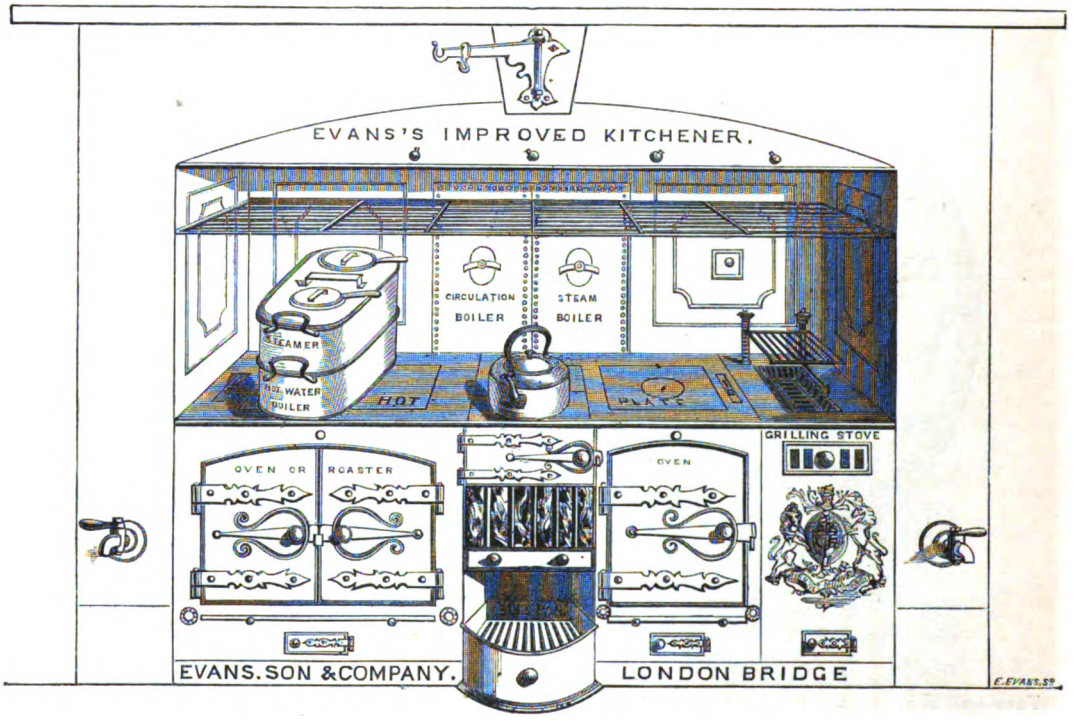
EVANS, JEREMIAH, SON, & CO., 33 *and* 34 *King William Street, London Bridge, E.C.*— Stoves, cooking apparatus, and lamps.



1. IMPROVED EVANS' KITCHENER, with hot-plate top, with loose plates, large wrought-iron oven on one side, and roaster on the other, fitted with shelves, best scroll spring latches and hinges; a broiling stove at one end, two capacious best hot rivetted wrought-iron boilers at back, one for steaming purposes if required, the other a sealed or pressure boiler for furnishing a constant supply of hot water all over a house for a bath, for wash-hand basons, or for the use of housemaids on the various landings, as may be found convenient, the back and sides fitted with metal covings or plates with regulating dampers, doors for cleansing the flues, and a wrought-iron rack or shelf the entire length of the apparatus for warming plates, keeping dinner hot, &c.; each boiler is furnished with a patent gun-metal draw-off cock for hot water, which may, if preferred, be fixed in the scullery, with pipes leading from the boiler or boilers. This apparatus is adapted for the use of large families. The width of the apparatus shown is 7 ft. 6 in. but for large establishments, as hotels, public institutions, &c. they are made up to 18 and 20 ft. in length.
2. COOKING APPARATUS of the same description as No. 1, but without the broiling stove and with one boiler; the width is 5 ft. 6 in.
3. COOKING APPARATUS of same description, but fitted with one oven or roaster, and one wrought-iron boiler at the side; the width of the one shown is 4 ft. but they are made of same construction from 3 ft. to 6 ft.
4. BERLIN BLACK HIGHLY-FINISHED REGISTER STOVE with bright front, electro-bronzed ornamental margin round ditto, and two ormolu twisted beads. A steel gadrone ashes pan fitted to ditto.
5. DEAD SPRUNG ARCH-FRONTED REGISTER STOVE, with burnished steel twisted moulding and lift-off ormolu ornaments, fire-brick back, &c.
6. BERLIN BLACK RADIATING REGISTER STOVE, with bevelled arch front, ornamental leafage moulding, and polished steel cable moulding. An improved radiating ashes pan fitted to ditto.
7. ELEGANT BURNISHED STEEL DRAWING-ROOM REGISTER STOVE, with highly chased enriched cable ormolu moulding, and centre and pendant ornaments; also steel cable moulding to inner front, bold bright bars with ormolu feet, banister bar, cut steel spikes, &c.
8. NEAT DRAWING-ROOM REGISTER STOVE, with burnished steel slip and bead round inner edge, and ormolu lift-off ornaments, porcelain cheeks, &c.
9. NEAT DINING-ROOM REGISTER STOVE, with splayed arch front with ormolu beaded mouldings round panels, of classic design.
10. BRIGHT DRAWING-ROOM REGISTER STOVE, with burnished steel ogee mouldings, rich ormolu centre and corner ornaments, with steel jewels, &c.
11. ROUND ORNAMENTAL WARM-AIR STOVE.
12. OCTAGON WARM-AIR STOVE of novel design.
13. CIRCULAR BERLIN BLACK FENDER to match stove No. 6, with polished steel cable bar.
14. RICH ORMOLU AND POLISHED STEEL FENDER, with scroll ends to match stove No. 7.
15. HANDSOME ORMOLU AND STEEL FENDER to match stove No. 8.
16. ELECTRO-BRONZED FENDER, to match stove No. 9.
17. BERLIN BLACK FENDER, with steel cable rod, &c.
18. ELECTRO-BRONZED FERN-LEAF PATTERN FENDER.
19. A varied assortment of STEEL FIRE FURNITURE AND POKERETTES to match the stoves and fenders exhibited, with heads of ormolu, bronze, cut steel, &c.; and with shanks plain, octagon cut, diamond cut, twisted, &c.; and illustrating the perfection of polish of which steel is susceptible.
20. BRASS CRINOLINE GUARD of improved construction.
21. JASPER MARBLE MANTEL-PIECE, very rich in colour, with arched opening; fitted to stove No. 6.
22. BOLD POVONAZZI MARBLE MANTEL-PIECE.
23. SIENNA MARBLE MANTEL-PIECE, with moulded shelf, bold columns at sides, &c.; adapted to stove No. 9.
24. PAIR OF SOLID POLISHED BRASS FIRE DOGS.

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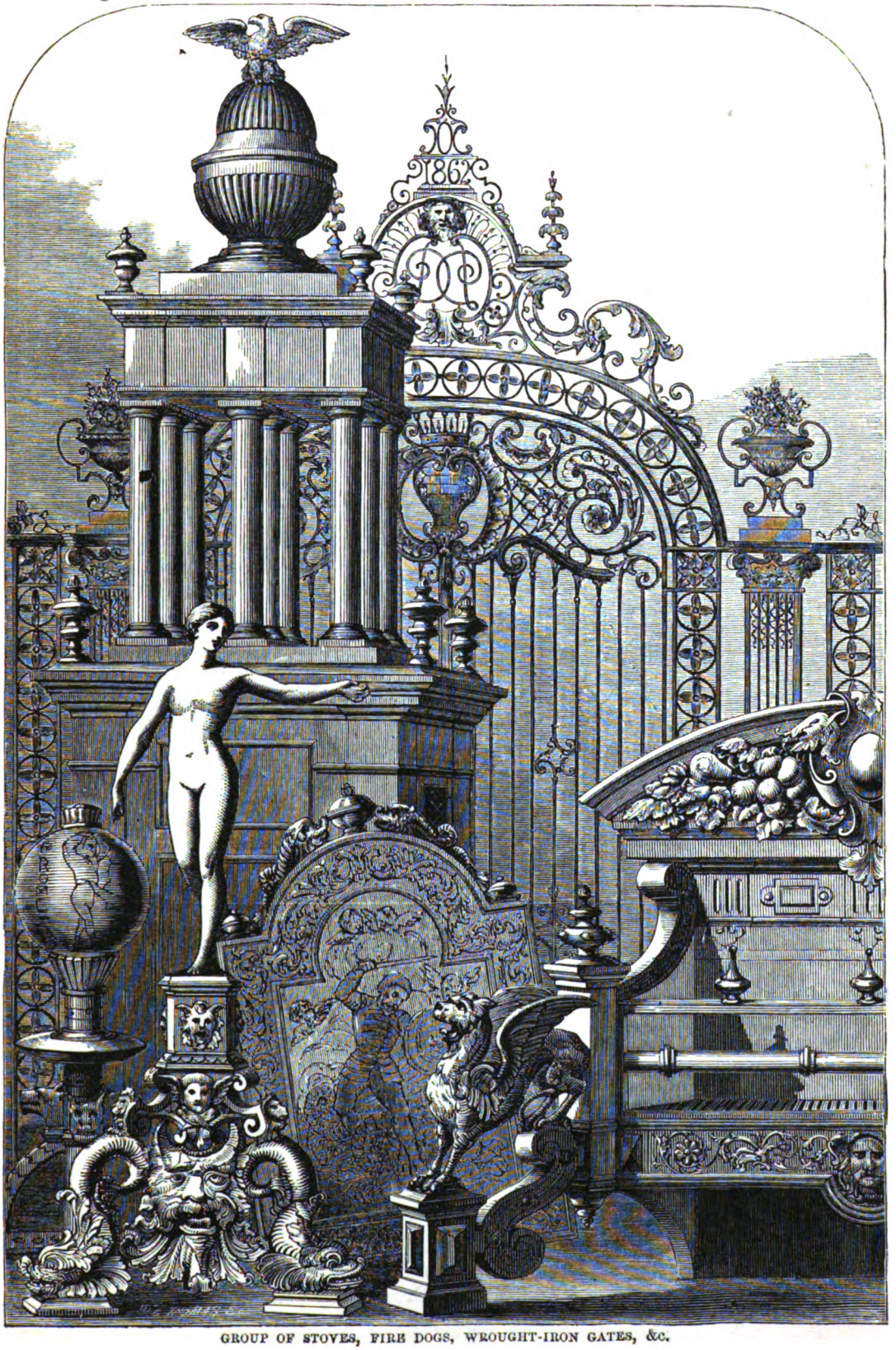
[6058]

FEETHAM, MILLER, & SAYER, 9 *Clifford Street, London.*—Ornamental iron and brass work, stoves, grates, and fenders, &c.



GROUP OF STOVES, FIRE DOGS, WROUGHT-IRON GATES, &c.

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[6059]

FIELD, WILLIAM, & SON, 224 *Oxford Street.*—Patent and other horse shoes as used in England.

[6060]

FIELDHOUSE, GEORGE, & Co., 3 *Poultency Street, Wolverhampton.*—Steel coffee and other mills.

The great superiority and cheapness of the exhibitor's best quality steel mills arises from the fact of their having introduced machinery in their production, by which means they are enabled to make each part to a standard size, so that it may be replaced (in case of loss or breakage) without the expense of carriage of the whole mill. The teeth of the grinding parts are made to one uniform angle and shape, which they have proved from considerable experience to be the best to ensure their grinding easily and quickly.

[6061]

FINCH, JOHN, *Priory Street Works, Dudley.*—Fenders, fire-irons, hat and umbrella stands, garden seats, and bedstead castings.

[6062]

FINLAY, JOHN, *Glasgow.*—Patent grates, exhibiting the most perfect central oven combination, with powerful radiation.

[6063]

FIRMAN & SONS, 153 *Strand, London, and* 2 *Dawson Street, Dublin.*—Military ornaments.

[6064]

FITZWYGRAM, LIEUTENANT-COLONEL, 15*th Hussars, Dublin.*—Improved horse shoes.

[6065]

FLAVEL, SIDNEY, & Co., *Eagle Foundry, Leamington.*—Improved kitchener.

[6066]

FRANCIS, EDWARD, *Camden Place, Dublin.*—Specimens of horse shoes for diseased and healthy feet, shod hoofs, &c.

Has obtained Medals and Honorary Certificate of the Royal Dublin Society.

This exhibitor holds the appointment of farrier to Her Majesty, the Lord Lieutenant, the officers of the staff, the metropolitan police, &c.

[6067]

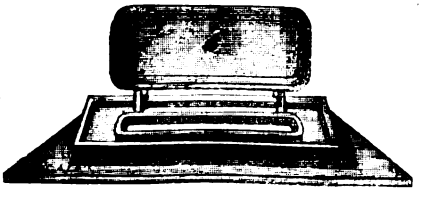
FREARSON, JOHN, 10 *and* 11 *Clement Street, Birmingham.*—Patent hooks and eyes for ladies' garments.

[6068]

FULLER, WILLIAM, 60 *Jermyn Street, London.*—Improved patent freezer for making cream and water ices.

[6069]

GALE, SAMUEL, 320 *Oxford Street, W.*—An arrangement of bell-wires to prevent friction or enlargement; a register for chimney; a curious lock made by an amateur locksmith 70 years ago.



The improved register exhibited is cheap, and can be applied to any stove. It effectually prevents the smoke from other chimneys entering a room where there is no fire.

[6070]

GEDDES, JOHN, 4 *Catedon Street, Manchester.*—Ornamental wire plant-stands, model rosery, and verandah.

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[6071]

GENERAL IRON FOUNDRY COMPANY, *Upper Thames Street, London.*—Stoves, mantels, bronzes, &c., cooking apparatus, coil cases, castings.

TABLE RANGE OR COOKING APPARATUS for centre of kitchen, contains two large and powerful wrought-iron ovens and two wrought-iron roasters, with wrought boilers capable of supplying very extensive steam and hot water apparatus, and a hot plate containing about 40 ft. of cooking surface. The smoke would be conducted away by means of underground flues to any available shaft.

This range is of extraordinary power, with one fire and an exceedingly small consumption of fuel, an immense amount of cookery in every possible variety can be conducted; it is estimated that dinners could be supplied for 3,000 persons in one day from this single apparatus, while it is equally adaptable for cooking a dinner for a dozen persons.

CLOSE-FIRE COOKING RANGE, 6 ft. with hot plate, two wrought-iron roasters convertible into ovens, and wrought-iron circulating boiler capable of heating 200 gallons of water.

This range is adapted for a large private family or small hotel; but is capable of unlimited extension; it is thoroughly effective as well as economical in the working.

COIL CASE for hot-water heating, of cast-iron bronzed, with white marble top, coil of pipes enclosed.

LARGE BLACK MARBLE MANTEL-PIECE, with sculptural features in fine bronzes (Potts's patent.)

STOVE for ditto, ventilating and smoke consuming (Taylor's patent).

FENDER AND FIRE IRONS for ditto.

CAEN STONE MANTEL-PIECE, of ecclesiastical character, with fine panel (the Sermon on the Mount) and other enrichments in bronze (Potts's patent).

STOVE for ditto, ventilating and smoke consuming (Taylor's patent).

FENDER AND FIRE IRONS for ditto.

STATUARY MARBLE MANTEL-PIECE, with electro-gilt metal enrichments (Potts's patent).

STOVE for ditto in burnished steel.

FENDER AND FIRE IRONS for ditto.

SIENNA MARBLE MANTEL-PIECE, with enrichments in oxidized silver metal work (Potts's patent).

STOVE for ditto, ventilating and smoke consuming (Taylor's patent).

FENDER AND FIRE IRONS for ditto.

Four WROUGHT-IRON WINDOWS (Moline's patent), extensively used for warehouses, wharfs, railway stations, and other public buildings.

STOVE fitted to show the action and mode of fixing of Billing's patent throats and air apparatus for the prevention of smoke.

ALTAR RAIL in cast-iron of gothic character. The design taken from Mr. Digby Wyatt's "Metal Work and its Artistic Design."

Series of FINE ARTISTIC BRONZES, suitable for architectural, cabinet, and other decorations, produced by Mr. William Potts of Birmingham.

Three TABLETS OR MURAL MONUMENTS, in bronze, produced by Mr. W. Potts of Birmingham.

Fourteen BALUSTERS for staircases of various designs, in cast-iron.

Four GRATINGS for heating or ventilating purposes.

CASTINGS, various.

[6072]

GIBBONS, JAMES, *St. John's Lock Manufactory, Wolverhampton.*—Ornamental locks, keys, and hinges, general ironmongery.

[6073]

GIBBONS & WHITE, 345 *Oxford Street.*—Wrought-iron weather-tight casements; Gibbon's patent lock furniture.

[6074]

GIBSON, THOMAS, *Cape Works, Birmingham.*—Specimens of springs, axletrees, and carriage iron work, patent and otherwise.

[6075]

GILLETT, WILLIAM, 18 *Back Street, Bristol.*—Two improved bottling machines.

[6076]

GINGELL, WILLIAM JAMES, *Bristol.*—Model of a uniform corn-meter.

[6077]

GLASS, ELLIOTT, & CO., 10 *Cannon Street, London; Manufactory, Cardiff.*—Iron and steel wire ropes.

[6078]

GODDARD, *Nottingham.*—New patent economical cooking apparatus either for a close or open fire.

[6079]

GOLLOP, EMILIA, *Charles Street, City Road, London.*—Redmund & Gollop's patent floor springs, rising and not rising hinges, gate hinges, &c.

[6080]

GRAY, A., & SON, 9 & 11 *Weaman Street, Birmingham.*—Fire-irons, &c.

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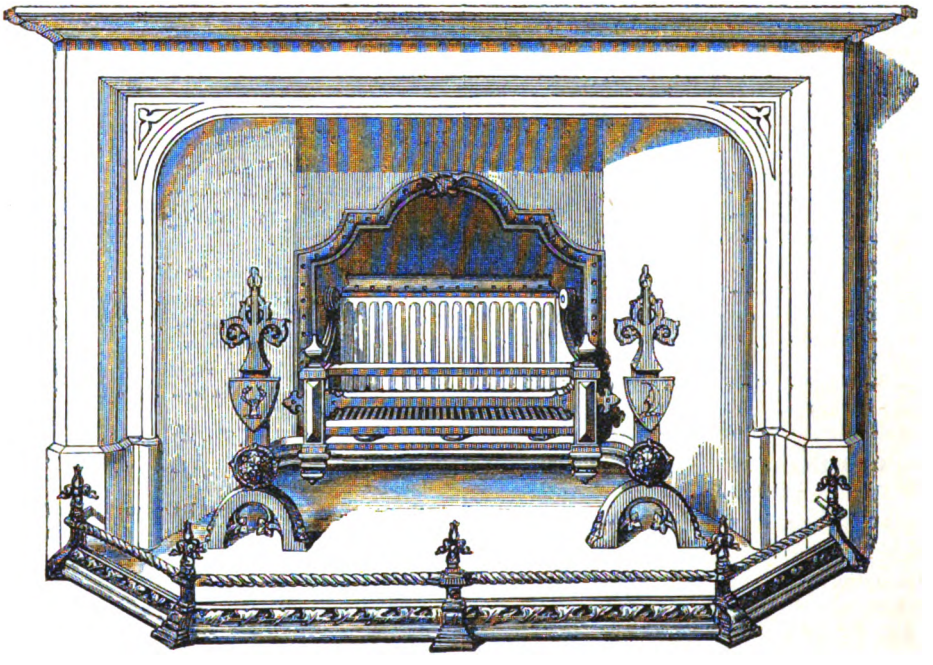
[6081]

GRAY, JAMES, & SON, 85 *George Street, Edinburgh.*—Stove with ormolu pillars.



JAMES GRAY & SON are stove grate makers to her Majesty, and manufacturers of kitchen ranges, bankers' safes, locks, &c. They exhibit a drawing-room stove with ormolu pillars, china tile covings, and fender to correspond.

[6082]

GREEN, JOSEPH, 134 *Irving Street, Birmingham.*—Builders' iron work, and other articles suitable for domestic purposes.

[6083]

GREENING & CO., *Manchester.*—Wire park fencing, manufactured of unusual strength and height by patent machinery.

[6084]

GREENING, N., & SONS, *Warrington, Lancashire.*—Wire cloth woven by steam power, of extraordinary width and strength.

[6085]

GRIFFITHS & BROWETT, *Birmingham, and* 8 *Broad Street Buildings, London.*—Wrought-iron tinned, japanned, and enamelled wares; tin-plate wares. (*See page* 37.)

[6086]

GROUT, ABRAHAM, 8 *Shephard Street, Spitalfields.*—Models of flower stands, summer houses, pheasantries, and ornamental fences in wire.

[6087]

GUY, S., 3 *Haunch of Venison Yard, Brook Street, New Bond Street.*—Specimens of horse-shoeing.

[6088]

HAGUE, THOMAS, *Bridge Street, Sheffield.*—Fire irons, with or-molu, bronze, and steel heads.

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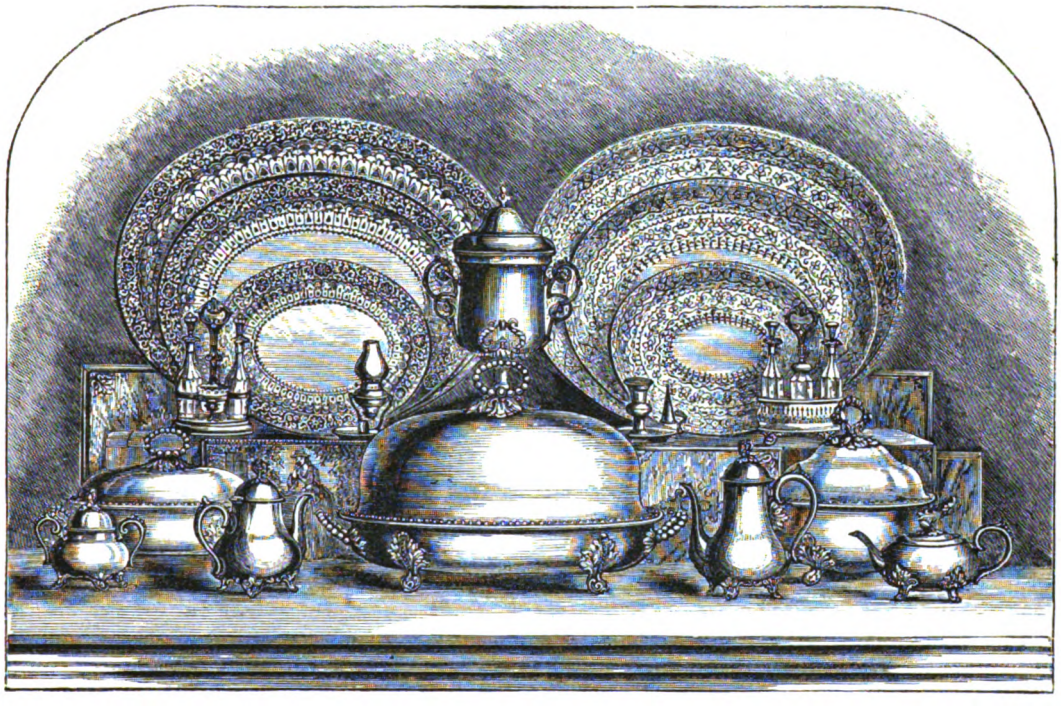
GRIFFITHS & BROWETT, *Birmingham, and 8 Broad Street Buildings, London.*—Wrought-iron tinned, japanned, and enamelled wares; tin-plate wares.

Obtained Prize Medals at the International Exhibitions of 1851 and 1855.

GRIFFITHS & BROWETT are general iron and tin-plate workers, japanners, manufacturers of tinned and enamelled wrought-iron hollow ware, Loysel's patent hydrostatic urns, Vose's patent hydropult, and Keevil's patent cheese-making apparatus.



GROUP OF WROUGHT-IRON TINNED AND JAPANNED WARES.

They exhibit:

A set of papier-maché trays, ornamented in the moresque style.

A set of papier-maché trays, ornamented in the Indian style.

Patent raised hot-water dishes and covers, soup and vegetable dishes, and soup tureens.

Patent tea and coffee pots, sugar basins, and cream jugs.

Papier-maché folios ornamented by a patent process.

Toilette sets, grocers' furniture, Persian coal vase.

A variety of curious and novel specimens of wrought-iron work raised from flat sheets of metal, without seam or brazing.

Paris patent enamelled ware, plain and printed.

[6089]

HALE, JAMES, *Hatherton Works, Walsall.*—Spring hooks, curb chains, pole chains, South American bits, &c.

[6090]

HALL, ROBERT, 4 *Laurie Street, Leith, Scotland.*—Malleable iron branding stamps. Impressions of ditto on wood.

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[6091]

HALLEN & HALLEN, 76 *Oxford Street.*—Stable fittings.

[6092]

HAMILTON & Co., 3 *Royal Exchange, E.C.*—Patent locks and safes. (*See page* 39.)

[6093]

HAMMOND, TURNER, & SONS, *Birmingham.*—Buttons, military ornaments, and fancy dress fasteners.

[6094]

HANDYSIDE, ANDREW, & Co., *Britannia Foundry, Derby.*—Fountains and vases.

Obtained a Prize Medal at the Exhibition of 1851.

FOUNTAIN, 6 ft. dia. 12 ft. 9 in. high.
Ditto 3 ft. 6 in. dia. 5 ft. 6 in. high.
Ditto 3 ft. dia. 5 ft. high.

VASE AND PEDESTAL 2 ft. 6 in. dia. 8 ft. 6 in. high.
LAMP PILLAR, with drinking fountain, 13 ft. high.

[6095]

HARLEY, GEORGE, 43 *Warwick Street, Wolverhampton.*—Patent lock and night latches.

[6096]

HARLOW & Co., *Smethwick, near Birmingham.*—Metallic bedsteads.

[6097]

HAWKINS, JOHN, & Co., 38 *Lisle Street, Leicester Square, and* 16 *Station Street, Walsall.*—Bits, stirrups, spurs, &c.

[6098]

HAYWARD, BROTHERS, 117 *Union Street, Southwark.*—Patent kitchen ranges, ventilators, coal-hole plates, lock furniture. (*See page* 40.)

[6099]

HEATON, RALPH, & SONS, *The Mint, Birmingham.*—Coins complete, and the same in progress of manufacture.

COINS complete, and the same in progress of manufacture, made by Messrs. Heaton for the English, French, Indian, Italian, and other governments.

Heaton & Sons furnish estimates for complete coinages, and execute them either in England or abroad.

[6100]

HENN, ISAAC, *Rea Street Works, Birmingham.*—Taper-pointed wood screws in iron and brass; also coach screws.

[6101]

HEWENS, RICHARD, 120 *Warwick Street, Leamington Priors.*—Improved Leamington kitchener, with Hewen's patent regulator.

[6102]

HIATT & Co., 26 *Masshouse Lane, Birmingham.*—Police handcuffs, leg-irons, padlocks, curb, dog-collars, &c.

[6103]

HILL & SMITH, *Brierley Hill, Staffordshire.*—Specimens of forged iron work, railway and cart axletrees, &c.

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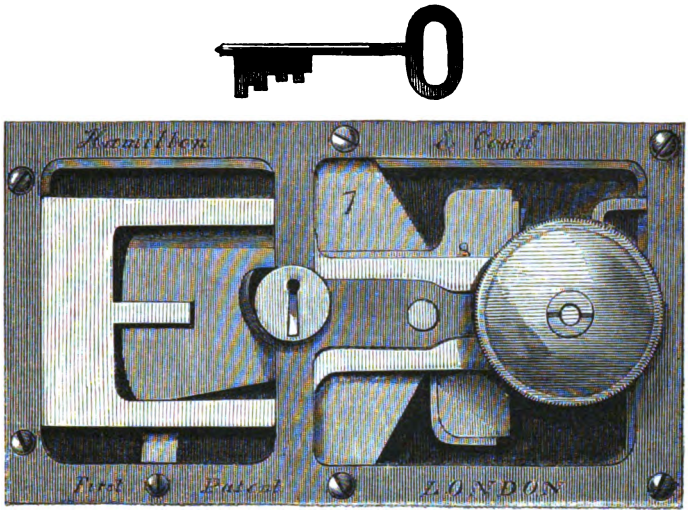
HAMILTON & Co., 3 *Royal Exchange, E.C.*—Patent locks and safes.

Silver Medal, Society of Arts, 1859.



FIRST PATENT LOCK.

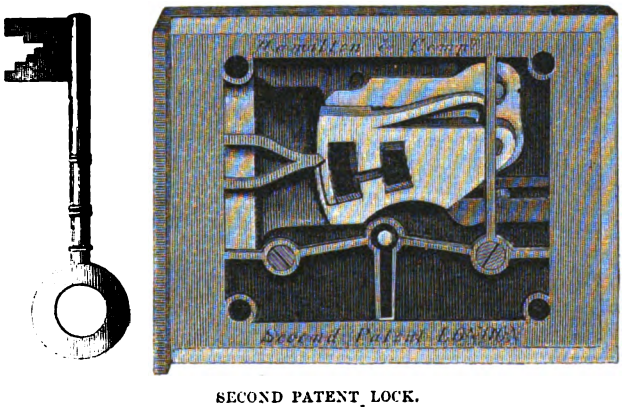
The FIRST PATENT LOCK possesses the following advantages:—

1. A very small key.—In locking, the bolt is shot by simply turning the knob. In unlocking, the key, which may be very small and light, is inserted and turned round once, raising the levers with a very gentle touch to the proper position, and is then taken out, and the bolt is withdrawn by turning the knob back again.

2. It cannot be picked, because the only time when the key-hole is open, is when the stump of the bolt is at a distance from the levers, and any instrument inserted through the key-hole holds the bolt fast and prevents it from being forced back against the levers in order to feel for the gratings. If the instrument be removed, the bolt can then be forced back, but the same action completely closes the key-hole.

3. It cannot be deranged, the levers being completely under control: if they are thrown down, the key raises them; if forced up too high they can be depressed by means of the handle.

4. Excludes air and damp.—When the lock is open the key-hole is closed. When locked, the key-hole may also be closed by bringing the bolt back a short distance; this excludes air and damp.



SECOND PATENT LOCK.

The peculiarity of Hamilton & Co.'s SECOND PATENT LOCK, which cannot be picked, consists in the tumblers being secured on a movable axis fixed on the tail of a bell crank lever, which when pressure is applied falls into a notch in the bolt, and on the pressure being continued the tumblers recede farther and leave a space between them and the stump of the bolt, so that the tumblers are always free.

They manufacture also lever and other locks, safes. deed and cash boxes, &c.

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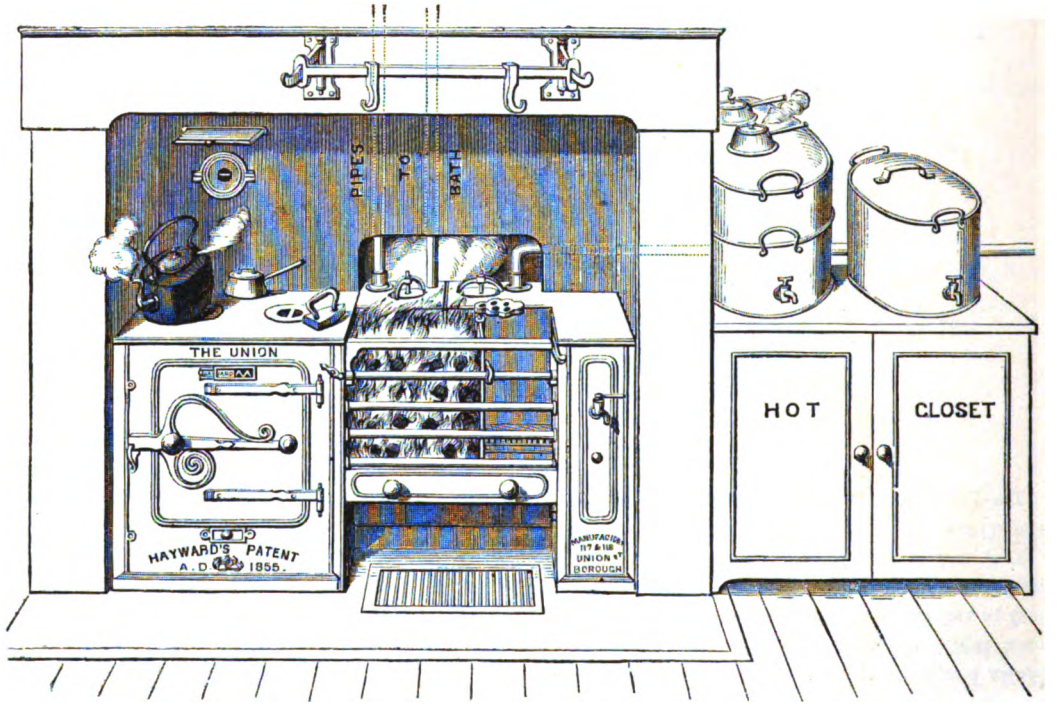
HAYWARD, BROTHERS, 117 *and* 118 *Union Street, Borough, London, S.E.*—Patent kitchen ranges, ventilators, coal-hole plates, lock furniture.



"THE UNION" KITCHEN RANGE.

1. "THE UNION" KITCHEN RANGE, with open fire.

In this range the whole of the hob above the oven is a boiling surface or hot plate, and it embraces all the advantages of an enclosed cooking apparatus without its offensive smell, imperfect ventilation, &c.

The oven may be kept "slow" or raised at pleasure for baking bread, &c.; or to a quick and scorching heat for roasting meat. When baking pastry the heat can be passed to the top of the oven to raise the crust, and then equally distributed; the quantity as well as the direction of the heat being entirely under control.

The boiler is adapted for heating a large supply of water to any part of the house, for baths, &c. A second boiler can be added for steaming, if required.

2. IMPROVED COAL-HOLE PLATES AND PAVEMENT LIGHTS, for safety, light, ventilation, and prevention of accident.

3. SHERINGHAM'S VENTILATORS, for the admission of fresh air through the external walls by day and night.

4. ARNOTT'S VALVES, for the extraction of vitiated air through the chimney breast.

5. CIRCULAR IRON STAIRCASES on an improved principle, which renders them very strong and firm.

Price lists of the above, and estimates for hot-water work, will be forwarded on application.

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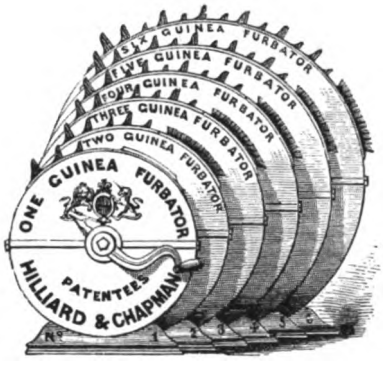
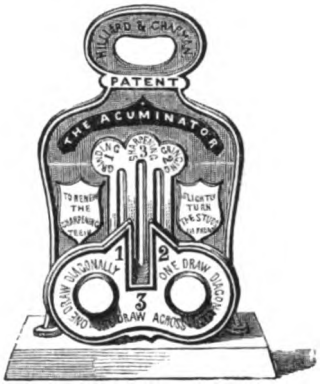
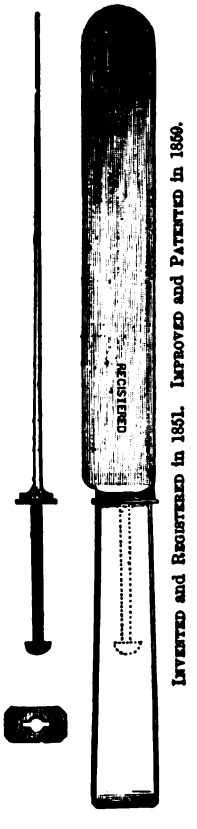
[6104]

CHAPMAN, THOMAS, late **HILLIARD & CHAPMAN,** 56 *Buchanan Street, Glasgow.*—Patent knife cleaners, knife sharpeners, and lockfast table knives.

***Obtained Prize Medal at the Exhibition of* 1851.**







INVENTED and REGISTERED in 1851. IMPROVED and PATENTED in 1856.

PATENT FURBATORS (improved knife cleaners), six different sizes, with pillar stand, box stand, and bracket for holding the same.

PATENT ACUMINATORS (improved knife sharpeners), various patterns and sizes.

PATENT LOCK-FAST TABLE KNIVES, various patterns, with section of handle showing the principle.

PORTABLE FORK CLEANER.

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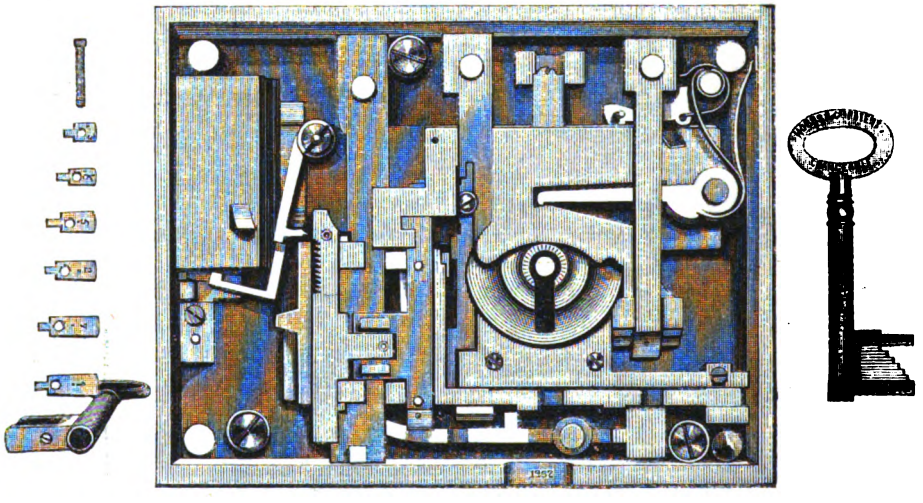
[6105]

HOBBS & Co., 76 *Cheapside, E.C.*—Locks, patent and machine made, and door lock fastenings.

The exhibitors are inventors, patentees, and manufacturers of bank, protector, and other locks, and the lock-making steam machinery.

Hobbs's locks have been awarded the following testimonials in their various competitions :—The Prize Medal of the Great Exhibition of London, 1851 ; the First-Class Medal of the Imperial Exposition of Paris, 1855 ; the Gold Medal of the Imperial National Mechanics' Institute of Vienna. In addition to these, are two gold and three silver medals from various Associations for the Promotion of Mechanical Science in the United States of America.

The locks exhibited on the stand to the right hand of the visitor, consist of the changeable-key bank lock and the protector locks.



HOBBS & Co.'s PATENT PARAUTOPTIC, OR BANK LOCK.

This lock, of which an illustration is subjoined, is deemed unapproachable as a security of the repositories of treasure, and impregnable against every practicable method of picking, fraud, or violence. The "bits" or steps on the "web" of the key, that act on the levers inside the lock, are separate, instead of being, as in other keys, cut on the solid metal. These movable bits are fastened by a small screw on the end of the shank of the key, when it has the appearance of any other lever-lock key. There are besides, spare "bits" to change, when desirable. The lock has three sets of levers, and is so constructed that, whatever arrangement the bits on the key may have when acting on the lock, the latter immediately adapts itself to the same arrangement, and will lock and unlock with perfect facility ; but it cannot be unlocked by any formation of the "bits" except that which locked it. Let it be supposed that the lock works with a "12-bitted" key, in proper numerical order, as 1, 2, 3, &c. up to 12. The bolt is shot by them, and will open by them ; but if a bit is changed in its place, the lock will remain locked, because, by the alteration, the key has become also changed in its action. to which change the levers will not answer. To re-lock in another form :—Suppose that, instead of the bits being arranged as 1, 2, 3, &c. the order is reversed, and they are screwed on as 12, 11, 10, &c. down to 1. By the self-changing principle of the lock, it assumes the new form of the key, and will work with it as readily and securely as it did before. The same results can be obtained by any and every permutation of the number of "bits" of which the key is composed, until millions, and thousands of millions of changes are worked, every change virtually converting the lock into a fresh lock by this simple transposition of the key. Hence its name of "Parautoptic," or changeable.

The illustration represents a view of the lock, the key, and the spare "bits." To give an idea of the number of times this lock can be transposed, it may be mentioned, that a key of only six bits can be altered 720 times ; and if two sets of bits are used, the transpositions extend to many thousands. The price of locks for bullion safes, and the doors of strong rooms, &c. of which the above is an illustration, is £20 ; and for cash and despatch boxes, and similar purposes, £10.

The keys can be made sufficiently small, if desired, either for the waistcoat-pocket or the travelling-case. It is claimed for both locks and keys that they illustrate the highest degree of scientific and mechanical skill in the locksmith's art.

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HOBBS & CO., *continued.*

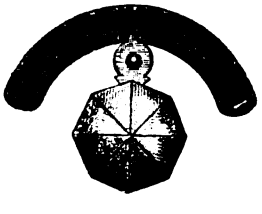
HOBBS & CO.'S PATENT PROTECTOR SOLID KEY AND INDEX LOCKS.

The patent protector locks are exhibited as possessing absolute security against picking by any method at present known. The key is what is called "solid," that is, that the "bits" or "steps" are cut on the solid metal of the "web," and, therefore, not changeable. They are specially adapted for places where the most ample security against lock-picking is required.

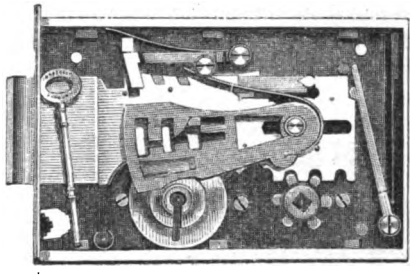
The "protectors" of this lock consist of a peculiar arrangement of certain parts behind the bolt and levers, unreachable by any lock-picking instrument whatever. When any tampering is attempted on the lock, by pressure on the bolt through the key-hole, to discover the opening position of each lever, the bolt protector comes into action, preventing the pressure affecting the levers in any way, thus holding them clear, and thereby frustrating the calculations of the thief. This principle was first introduced in locks at the memorable Exhibition of 1851, and forms the foundation of a new security. The key and bolt fraud-protector is a movable nozzle, now first introduced. These two protectors combined are offered to the public, as the two essentials of security—protection against picking, and protection against fraud. Specimens are shown illustrating the action of the protectors. There is also a model showing the arrangement of the bolts and locks as fixed on a strong-room door. The protector locks are sold, retail, at prices varying from 10*s.* to 40*s.*

HOBBS & CO.'S PATENT LOCK INDICATOR.

This is a method of locking the doors of iron safes, strong rooms, customs stores, bonded vaults, prison cells, corridors, &c. by means of the handle, without a key, and showing to what extent the bolt has been shot. It may consist of the upper half of a dial, upon which are the words, "Open," "Shut," "Locked." When the door stands

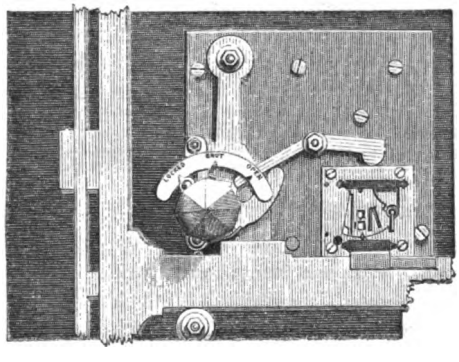


merely closed to, the index finger rests on "Open." This finger is fixed to the handle that works the lock, and therefore, whichever way the handle moves, the finger must move with it. Turn the handle, and fasten the door by the first movement of the bolt, the finger will point to "Shut." A second motion of the handle, and the bolt shoots out beyond its reach, the finger, at the same moment, resting on "Locked." The lock can only be opened by the key, because, at the second turn, the handle loses its control of the bolt. The action of the bolt returning into the lock, or unlocking, takes the index finger back to "Open," re-setting it again. The advantages of this index in dock yards, shipbuilders' stores, dock warehouses, prisons, &c. where certain officers are limited to departments of the premises, by day or night, must be of the highest importance. The superior officer would be able, by its use, to see in an instant what condition the bolts of the locks were in,



without "trying" his keys, as he passed along a corridor, or by a range of rooms. Again, if the door of a safe or strong-room was closed tight, there would be no danger of leaving it unlocked by neglect, as a glance at the index would show whether it had been locked or not. Specimens are also exhibited, showing the application of the "lock-index" principle to street-door latches, and convict and other prison cells.

In the case on the right hand is a model, showing how applied to bankers' strong-room doors, of which an illustration is here given. This arrangement gives quadruple security against violence, which is obtained by levers, eccentrics, and other means.



In the centre of the stand is a first-class strong-room door. It is made of the best iron-plate, back and front, the interior being lined with slabs of hardened steel. In this door the bolts are of the usual arrangement—they are thrown by the knob, an examination of which will show the great security attained by Hobbs and Co.'s patented method for security. It will be seen to consist of triple security against violence of all kinds, while the lock is peculiarly constructed and is powder-proof, holding less than twenty grains of gunpowder, which is totally insufficient to blow it off.

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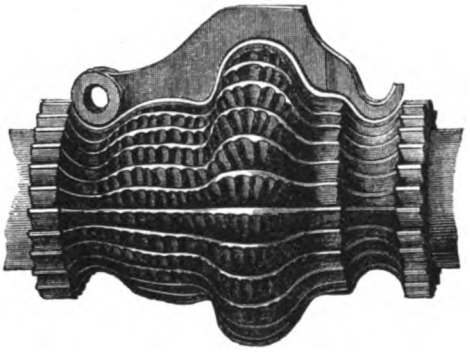
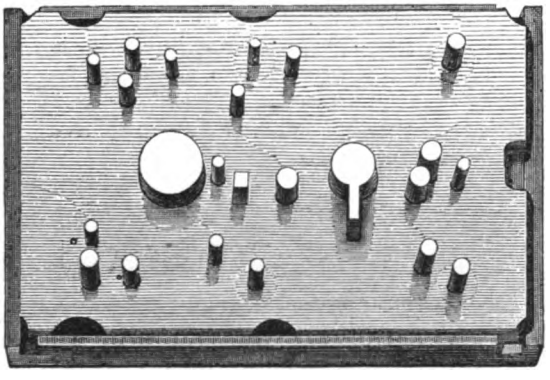
HOBBS & CO., *continued.*

HOBBS & CO.'S MACHINE-MADE LOCKS.

This group of locks is in the stand on the left of the spectator. They are constructed in all sizes and varieties, suitable for every purpose for which locks are used. In consequence of their manufacture by steam-machinery, in a manner previously unknown in the trade, they exhibit the first important step of progress in this country, in the economy of lock-producing. By means of the different machines used in the making, a faultless accuracy is arrived at, which, by hand, would be quite impossible.

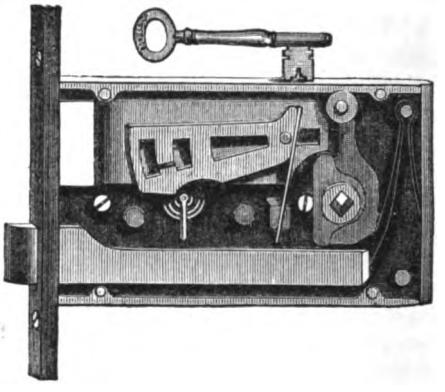


Annexed are illustrations of cutters and dies by which such accuracy is obtained :—



These locks possess a strong recommendatory quality to the owners and occupiers of house property, in their comparative cheapness to hand-made locks, being made of superior materials, combined with the nicety of the finish of the working parts, effected by the machinery, and their universal adaptability. References can be given to most of the Government offices, as to their durability and security; and also to nearly all the metropolitan and many of the country banks, as well as to architects, engineers, and builders of the highest standing. They are made from two up to five levers, and the retail price ranges from 2*s.* upwards. For cottages, mansions, warehouses, &c. these locks will be found most desirable. They are very extensively used by builders, for doors, closets, cupboards, &c. and by cabinet makers for sideboards, wardrobes, desks, drawers, dressing-cases, and all kinds of cabinet work.

The woodcut shows a mortise lock, adapted for room doors, price 8*s.* The security consists in a series of levers being raised to unequal positions by the bits of the key before the bolt can pass.



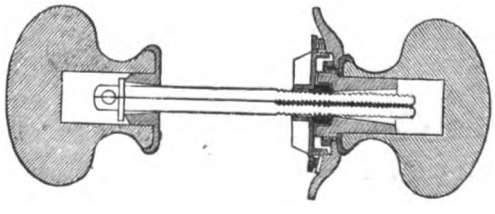
Both the protectors and the machine-made lever locks can be fitted in suite for master-keys to pass a given number of locks, that otherwise open with a different key each. The convenience afforded by a master-key in premises divided among subordinates is very great. All the locks of Messrs. Hobbs & Co. can be obtained from every respectable ironmonger in Great Britain and Ireland. Merchants and shippers are also supplied, at wholesale prices, for exportation.

DOOR LOCKS.

	s.	*d.*
6 in. 1 bolt mortise, 2 levers, 1 key each . .	5	0
7 in. 2 bolt ditto 4 ditto ditto . .	9	6
6 in. 1 bolt rim 2 ditto ditto . .	4	0
6 in. 2 bolts ditto 2 ditto ditto . .	5	6
7 in. 2 bolts ditto 4 ditto ditto . .	10	0

CABINET LOCKS.

2¾ in. till, 4 levers, 1 key each	2	0
3 in. till, 4 ditto ditto	2	6
3 in. cupboard, 4 levers, 1 key each . . .	2	6
4 in. ditto 2 levers, japanned.	2	0
2½ in. box, 2 levers, 1 key each	2	0



HOBBS & CO.'S PATENT LOCK FURNITURE.

This lock furniture is so planned that the most unskilful workman cannot fail to fix it properly. It is self-adjusting; the handle will not bind at whatever angle the lock may be mortised. It is very moderate in price, will endure hard and lengthened wear, and acts without friction.

Manufactory, Arlington Street, Britannia Fields, N.

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[6106]

HOOD, SAMUEL, & SON, 68 *Upper Thames Street, London.*—Stable fittings.

SET OF STABLE FITTINGS, consisting of improved hay rack with patent spring top, enamelled manger, enamelled water cistern with removable cover, and noiseless tying apparatus with the halter and head piece.

SET OF LOOSE-BOX FITTINGS, consisting of hay rack, manger, and water cistern with improvements as above.

STALL DIVISION, consisting of wrought-iron heel post, cast-iron ramp, middle rail, panel, and sill.

DIVISION FOR LOOSE BOX, consisting of wrought-iron door post and shutting post, door with improved hinges, top rail, middle rail, panel, and sill.

SURFACE DRAIN and drain trap of improved construction.

IMPROVED SADDLE BRACKET.

[6107]

HOOD, WILLIAM, 12 *Upper Thames Street, E.C.*—Drinking and garden fountains, lamp-posts, lamps, and specimen castings.

[6108]

HOOLE, HENRY E., *Green Lane Works, Sheffield.*—Grates, fenders, fire irons.

[6109]

HOPKINS, J. H., & SONS, *Granville Street, Birmingham.*—Block tin, stamped, tinned iron, and japanned articles. (*See page* 47.)

[6110]

HULSE & HAINES, *Ichnield Street West, Birmingham.*—Brass and iron bedsteads.

[6111]

HURST, C. H., *Royal Road, Kennington Park, S.*—Patent wrench and mallet to save all taps from damage, and infallible transparent cement to repair china, glass, &c.

The tap wrench and mallet is an ingenious contrivance for preventing damage to wine and other taps. Price 2*s.* complete. Lever tap wrench alone, 1*s.*

The cement will effectually repair broken glass or china. It is transparent, and will bear washing in hot water. Price 1*s.* and 2*s.* per box. Post-free for 14 or 28 stamps.

[6112]

ILES, CHARLES, *Peel Works, Birmingham.*—Hooks and eyes, thimbles, pins, needles, hair pins, &c.

Obtained a Prize Medal at the Exhibition of 1851.

Specimens of hooks and eyes, thimbles, patent enamel-lined thimbles, solid-headed pins, hair pins, and fancy boxes, and articles for containing and connected with the above manufactures.

[6113]

ILIFFE, & PLAYER BROTHERS, *Birmingham and London.*—Buttons, medals, military ornaments, and patent umbrellas.

(*Prize Medal awarded at the Exhibition*, 1851.)

The PATENT LINEN BUTTON is made from one piece of metal, which so firmly clasps the linen covering, that, unlike all other linen buttons, it is impossible by mangling or washing to separate them. This button is also made with two centre eyeleted holes, forming between them a bar for the thread to ride on.

The PATENT BRACE BUTTON, so constructed that the front shell overlapping the bar at the back, presents only a flat surface, instead of an edge, as in other brace buttons.

[6114]

INGRAM, GEORGE WELLS, 1 *Lombard Street, Birmingham.*—Powder flasks, shot pouches; crimping and goffering machines.

[6115]

ISMAY, THOMAS, & Co., *Dover.* — Improved close-fire ranges for large kitchens. (*See page* 48.)

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[6116]

JAMES FOUNDRY COMPANY, THE, *Walsall.*—Iron and brass, and builders' ironmongery.

[6117]

JAMES & SONS, *King's Norton, and Bradford Street, Birmingham.*—Patent self-boring wood-screws.

[6118]

JAMES, J., & SONS, *Victoria Works, Redditch.*—Needles and fish-hooks.

[6119]

JEAKES, C., & CO., 5 *Great Russell Street, Bloomsbury, London.*—Kitchen range and fittings; grates, brass and iron work. (*See page* 48.)

[6120]

JEAVONS, I. & D., *Petit Street Works, Wolverhampton.*—Wrought-iron hollow-ware, &c.

[6121]

JEFFREY & JAFFRAY, 2 *Allen's Court,* 387 *Oxford Street, London.*—Wire work.

[6122]

JENKINS, HILL, & JENKINS, *Milton Works, Birmingham.*—Wire iron, iron and steel wires, &c.

[6123]

JONES, J., *Swansea.*—Flat chain.

[6124]

JONES & ROWE, *Worcester.*—Patent range, comprising fire, 4 ovens, 2 closets, boilers, and steam closet. (*See page* 49.)

[6125]

JONES, T. F., & SONS, *Soho Works, Cecil Street, Birmingham.*—Stoves, grates, fenders, fire irons, and light steel toys.

[6126]

KEITH, GEORGE, 55 *Great Russell Street, Bloomsbury.*—Ice machines; freezing powder and apparatus for hot climates. (*See page* 50.)

[6127]

KENNARD, R. W., & CO., 67 *Upper Thames Street, and Falkirk, N.B.*—Ornamental castings in iron. (*See page* 51.)

[6128]

KENRICK, ARCHIBALD, & SONS, *West Bromwich.*—Patent cast-iron tinned and enamelled hollow ware, &c.

[6129]

KENT, GEORGE, 199 *High Holborn, and Strand, London.*—Knife-cleaning machines, and other inventions for promoting domestic economy. (*See pages* 52 *and* 53.)

[6130]

KINGTON & TROWBRIDGE, 116 *Aldersgate Street.*—Platform and every description of weighing machines, scales, &c. (*See page* 54.)

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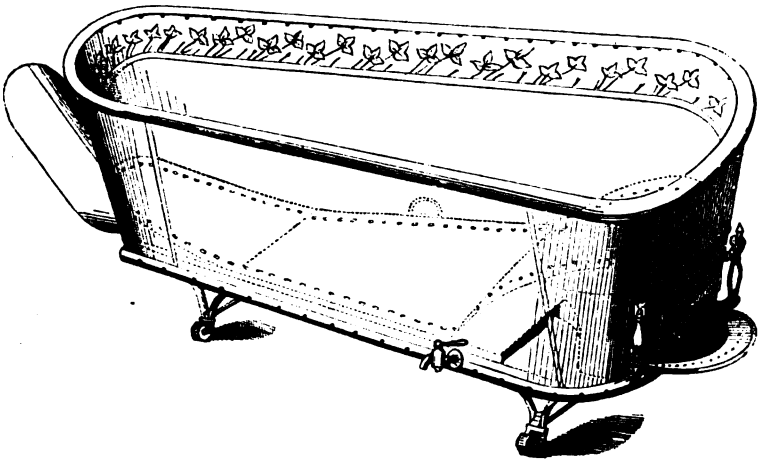
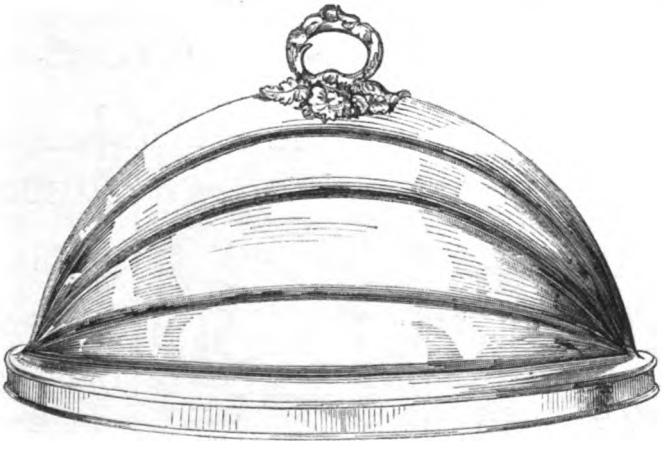
HOPKINS, J. H., & SONS, *Granville Street, Birmingham.*—Block tin, stamped, tinned iron, and japanned articles.

Obtained a Silver Medal in Class 16, *in Exposition Universelle, Paris,* 1855.



PORTABLE HOT-WATER BATH.

Portable hot-water bath, with shower bath attached, combining perfect portability, completeness, rapidity of heating, cheapness of action, and lowness of cost, J. Wilson's patent. Messrs. Peck & Co. agents in Amsterdam.
Block tin hot-water venison dish and cover, 24 in. melon pattern.
Block tin dish covers, melon pattern, complete set, viz. 1 each, 9, 10, 11, 12, 14, 16, 18, 20, 22 in.
Block tin hot-water meat dish, with cover, 18 in. fluted pattern.
Block tin hot-water dish for jugged hare, hash, or steak, fluted pattern.
Block tin soup tureens, plain oval.
Ditto vegetable or side dishes, oval, with or without hot-water pan.
Block tin vegetable or side dishes, oblong.
Ditto chop plate for hot water, with fluted cover.
Ditto hot-water plates, cheap.
Ditto ditto with earthenware plate.
Ditto plate covers only.



VENISON DISH AND COVER.

Block tin tea and coffee set, cheap, with stamped tinned iron tea and coffee cups and saucers.
Ditto tea and coffee set, middle quality.
Ditto ditto best quality, plain.
Ditto ditto ditto embossed.
Block tin and plate-glass lantern for Price's candle, brass bails and very strong.
Block tin and cylinder glass lantern for Price's candle, brass bails and very strong.
Block tin cottage hastener, with patent roasting jack, complete.
Stand of stamped and tinned iron bowls, 9 to 30 in. dia.
Ditto ditto pudding pans, 4 to 20 in.
Ditto ditto milk pans 16 to 24 in.
Ditto ditto baking dishes, 9 to 18 in.
Ditto ditto bowls, 4½ to 11½ in.
Set of japanned iron tea trays, 16, 24, 30 in.
Japanned tinned iron toilet set for bath-room use, consisting of foot bath, hot-water jug, and waste-water pail.
Japanned tinned iron sponging bath, stamped from one sheet of iron without seam or join.
Japanned tinned iron toilet set for bedroom use, consisting of wash-hand basins and ewers, vase, sponge tray, soap boxes, and brush trays.
Japanned tinned iron strong cash boxes, 10, 12, 16 in.
Ditto iron coal vases, with brass mountings.
Ditto tin railway lamps, including buffer head, porters', guards', and engine lamps.
Japanned tinned iron canteen, containing the most useful articles in a small compass.
Board of brass furniture for baths, lamps, &c.

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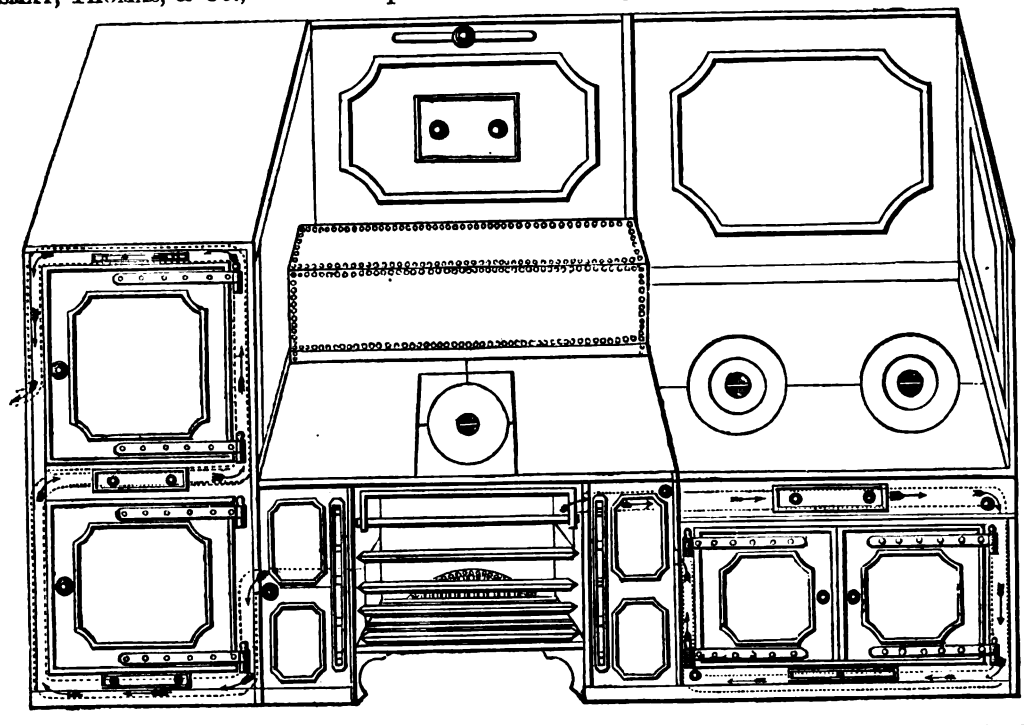
ISMAY, THOMAS, & Co., *Dover.*—Improved close-fire ranges for large kitchens.



ISMAY & Co. are engineers, smiths, and iron merchants, and manufacturers of large ranges, steam closets and counters, drying closets, laundry steam apparatus, kitchen steam apparatus, dinner and coal lifts for hotels, mansions, or public buildings.

The exhibitors' workmen sent to all parts of England to fix ranges, &c.

Architects' and contractors' communications will be answered, and drawings, plans, and estimates furnished on application.

JEAKES, C., & Co., 51 *Great Russell Street, Bloomsbury, London.*—Kitchen range, &c.

The following articles are exhibited by C. JEAKES & Co.:—

1. KITCHEN RANGE, smoke jack, hot plate, with oven, hot closet, and charcoal stove.
2. PATENT SMOKELESS GRATE, will burn from 24 to 36 hours without replenishing, consuming under 1 lb. of fuel per hour, and may be seen in action at 51 Great Russell Street, Bloomsbury.
3. GRATE (circular headed), for drawing room, Italian in character, with painted tiles, and ormolu mountings.
4. GRATE, French in design, bright covings in panels, with ormolu mountings, and richly ornamented back.
5. LARGE GRATE, renaissance in character, with handsome brass dogs, rich back, and diaper covings, with monogram of International Exhibition, 1862.
6. LARGE MEDIÆVAL DOG GRATE.
7. SMALL MEDIÆVAL DOG GRATE, with diaper back, and English badge in circle of back.
8. Dogs for grates, designed and modelled especially for the Exhibition of 1862.
9. GOTHIC GRATE, with tiles and metal mountings.
10. ARCHITECTURAL TRUSSES OF FRUIT, one as a specimen of casting, the other finished for decorative purposes.
11. CHIMERA.
12. LAMP AND PILLAR, adapted for stone pedestal.
13. GOTHIC HINGES, for ecclesiastical purposes.
14. SPECIMEN OF BRASS WORK, for door furniture, for domestic purposes. Designed by T. H. Wyatt, Esq.
15. BELL PULLS (selections of).
16. WROUGHT-IRON GABLE TERMINALS AND RIDGES, for roofs.

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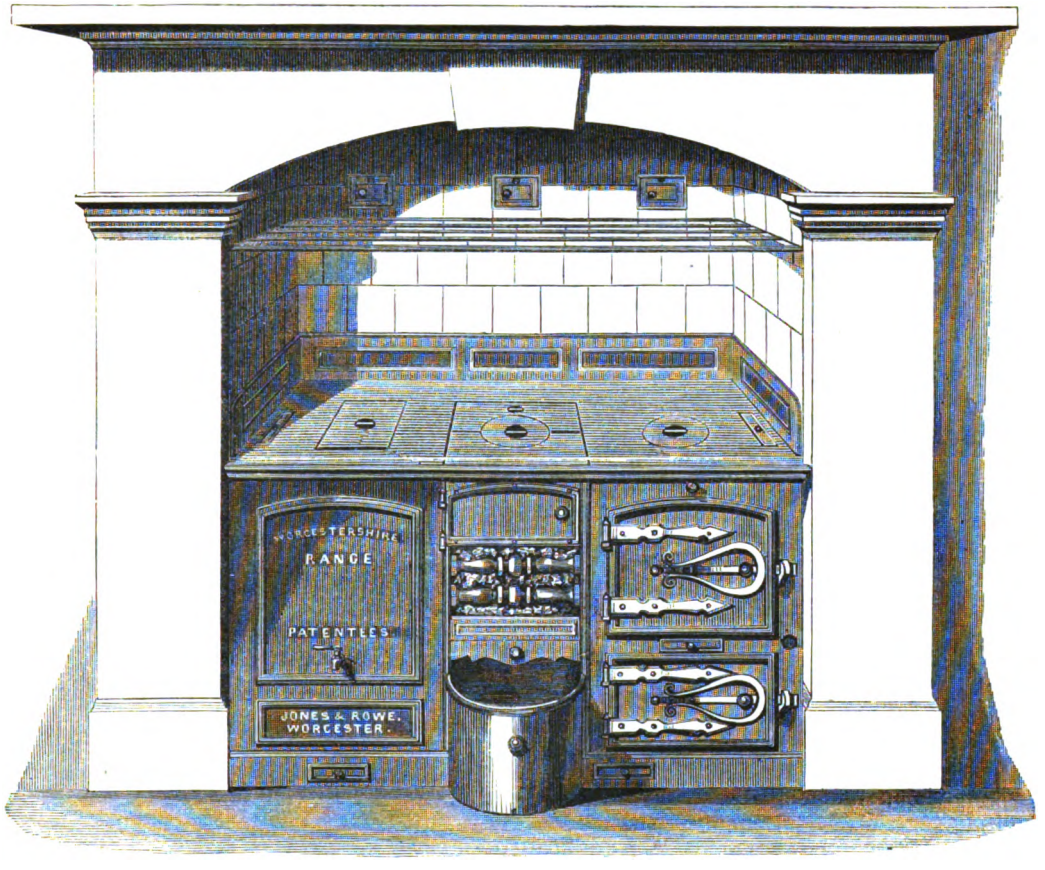
JONES & ROWE, *Worcester.*—Patent Worcestershire range, comprising 2 large meat roasters, 2 pastry ovens, 2 large hot closets, 1 grilling stove, 2 boilers, one for steam and one for circulating hot water to any part of the house, treated by one fire, and capable of cooking sufficient for 200 persons.



JONES & ROWE'S PATENT RANGE.

"A more economical arrangement for fuel, in the accomplishment of a great deal by small means, or a more compact contrivance for cooking at once all the courses necessary for a dinner, was probably never seen."—*Worcester Herald.*

"A valuable peculiarity of Messrs. Jones & Rowe's range, is the placing of the oven and roaster, or the two ovens, one above the other, instead of side by side, the heat being made to pass, by means of flues, beneath the entire surface of the range. The roasting oven is constantly replenished with fresh air, and though the top of the range is an iron platform, enclosing the fire, a joint can be cooked at the open front in the old way."—*Daily Telegraph*, May 19, 1862.

One side of the range is occupied by a wrought-iron boiler, holding fourteen gallons; on the opposite side are two ovens, one above the other; the one for roasting meat, and the other for pastry, or for baking bread. The whole top of the range is a flat iron platform, which may be covered with vessels for boiling, stewing, &c. In front of the fire a large roasting joint may be cooked. The advantages of the patent are, that by one moderate fire hot air is generated, which, by means of flues, is made to pass beneath the entire surface of the range, whereby the ovens, boiler, and platform are sufficiently heated for all purposes of cooking; and one of the ovens, or meat roaster, is constantly ventilated with fresh air, which prevents the unpleasant flavour sometimes imparted to baked meats. The boiler is constantly kept boiling from the same fire; and a boiler might be introduced at the back of the fire, for supplying hot water to a bath or cistern, to any part of the house.

This range having now become familiarly known, is universally admitted to be the best yet introduced for economy, durability, cleanliness, and convenience. No kitchen range made can surpass it.

J. & R. have received most valuable testimonials to the excellence of the above ranges. Ranges delivered carriage free; books of illustrations, with prices and testimonials, will be forwarded on application, and estimates and plans given for fitting up large kitchens with J. & R.'s patent ranges, and supplying hot water to baths, steam kettles, or to any part of the house, to any proposed arrangement.

J. & R. wish it to be understood there is no other range made, price and size compared, that will cook for so many persons as the above.

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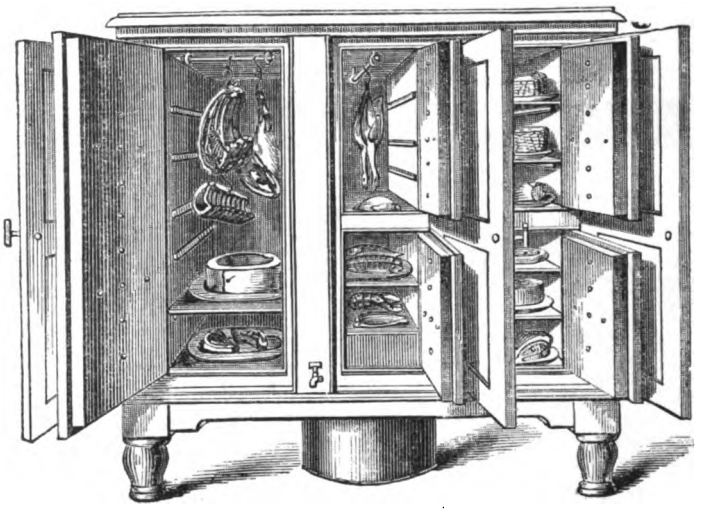
KEITH, GEORGE, 55 *Great Russell Street, Bloomsbury.*—Ice machines; freezing powder and apparatus for hot climates.



KEITH'S IMPROVED LING'S PATENT ICE SAFE.

This invention shows the application of ice for the perfect preservation of meat, poultry, fish, and all other edibles, without destroying the original flavour or coming in contact with the ice, fitted with arrangements for icing wines, spring water, &c. at a very small daily consumption of ice. Especially adapted for the use of clubs, hotels, butchers, poulterers, and large establishments.

Size 6 ft. high, 5 ft. wide, 2 ft. 8 in. deep. Price £60.

[6131]

KNIGHT MERRY, & Co., 131 *Bradford Street, Birmingham.*—General tin-plate articles. (*See page* 55.)

[6132]

LAMBERT, BROTHERS, *Walsall, Staffordshire.*—Wrought-iron welded tubes; iron and brass fittings; chandeliers; metallic tubular bedsteads. (*See pages* 56 *to* 58.)

[6133]

LANE, HENRY, *Wednesfield, near Wolverhampton.*—Every description of wild beast, game, and vermin traps.

[6134]

LEADBEATER, JOHN, & Co., 125 *Aldersgate Street.*—Wrought-iron fire and thief proof safes.

[6135]

LEIGHTON, JOHN, 40 *Brewer Street, Golden Square.*—Reserve stoves to prevent smoke formation; Maltese chimney caps.

[6136]

LESLIE, GEORGE, *Upper Mall, Hammersmith, W.*—Patent self-acting valve for preserving brewers' casks from becoming mouldy.

[6137]

LEWIS, WILLIAM, 6 *New Westgate Buildings, Bath.*—A gas cooking stove, and a confectioner's tartlet warmer.

[6138]

LINES, W. D., & PALMER, W., 1 *Marlborough Road, St. John's Wood.*—Horse shoes suited for all purposes.

[6139]

LINLEY, THOMAS, & SONS, *Stanley Street, Sheffield.*—Patent double-blast bellows; patent portable forges; portable vice benches, &c.

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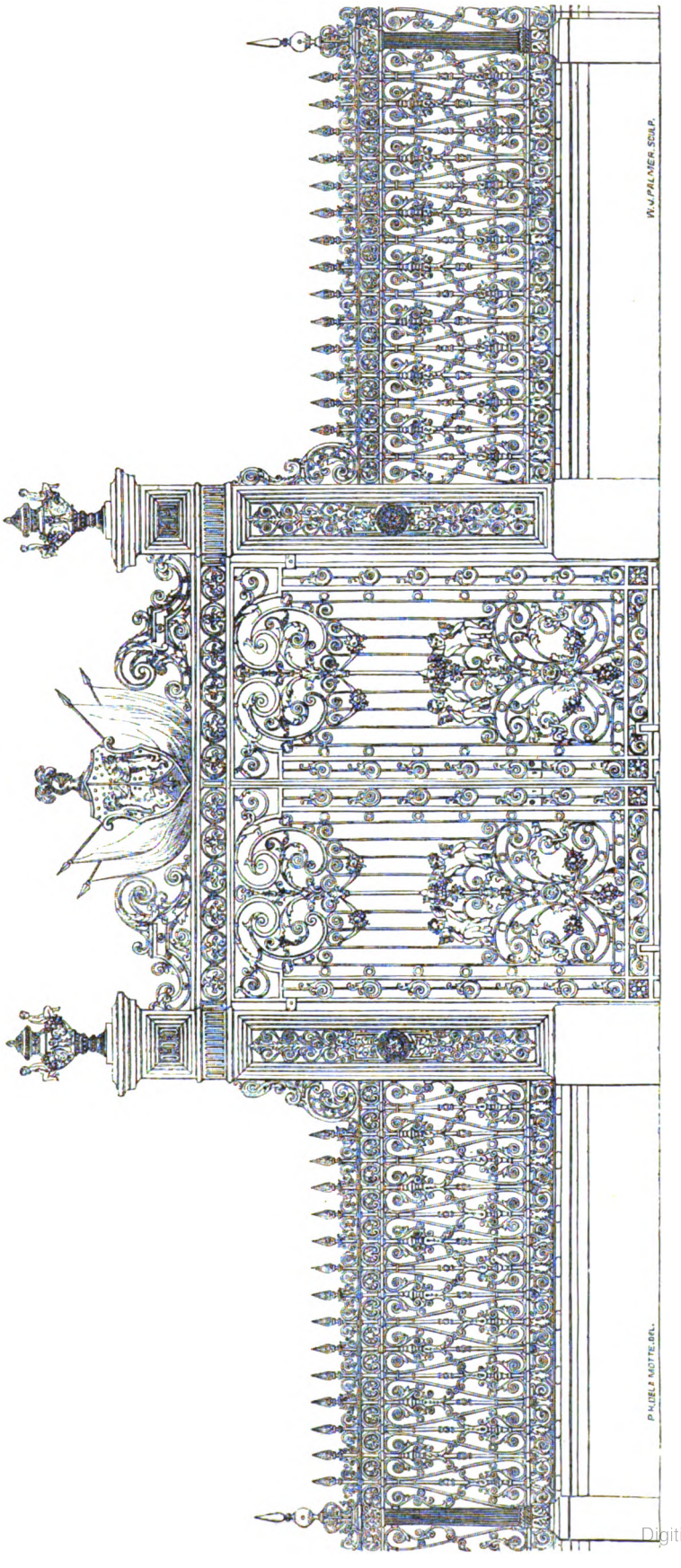
KENNARD, R. W., & Co., 67 *Upper Thames St., and Falkirk, N.B.*—Ornamental castings in iron.



CAST-IRON ORNAMENTAL ENTRANCE GATES AND RAILING, manufactured by Messrs. Kennard, at the Falkirk Iron Works, N.B. for the Vista Alegre Palace, lately purchased by His Excellency Don José de Salamanca from Her Majesty the Queen of Spain. Also exhibitors of cast-iron verandah, with vases and other ornamental castings, as well as drawings of various bridges erected by them in Spain, India, and Italy, and also of the celebrated viaduct at Crumlin, Monmouthshire.

CASTINGS of every description, in loam or sand, to order or model, for engineers, builders, and machinists, gas and water works. Stoves, ranges, sugar pans, teaches, or boilers to any pattern or make.

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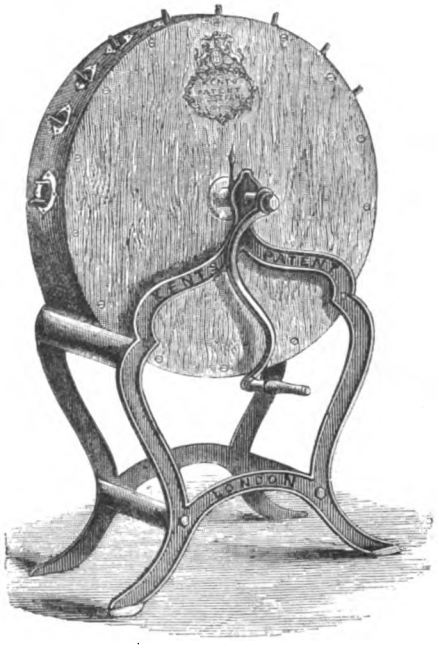
KENT, GEORGE, 199 *High Holborn, and Strand, London.*—Knife-cleaning machines, and other inventions promoting domestic economy.



KENT'S PATENT ROTARY KNIFE-CLEANING MACHINE.

A prize medal was awarded to this invention at the Great Exhibition of 1851; since that period a second patent has been granted to G. Kent for certain improvements, which have greatly enhanced its value, not only in general efficiency and durability, but also as a sharpener of table cutlery. The unparalleled success and high reputation gained by this machine throughout the world, has tempted some unscrupulous persons to put forth spurious imitations, but as a second patent protects the construction of the most essential parts of Kent's machine, it remains unapproached in its efficiency and durability.

Made in eight sizes, from 3 to 14 guineas, to clean from 3 to 9 knives at a time.

KENT'S WASHING APPARATUS.

A very simple, economical and effectual mode of cleansing linen, requiring comparatively no hand rubbing, and dispensing with boiling altogether.

Price from £3 10

KENT'S FOLDING CLOTHES DRYER is intended to supersede clothes posts and lines, and consists of an upright standard from 10 to 13 ft. high, supporting five ribs or arms. These arms, which expand and fold like an umbrella, contain clothes lines, affording from 120 to 150 ft. of hanging space. It revolves with the wind, and may be raised or lowered as desired.

Price from £1 5

KENT'S DOUBLE-ACTION BOX MANGLE.

In general appearance this mangle resembles the old kind of box mangle, but has some very important advantages, viz. the backward and forward motions are obtained by turning the handle always in one direction. It is much lighter than any other mangle on this principle, more easy and rapid in working, and is perfect in general manufacture.

Price from £9 0

KENT'S SELF-HEATING BOX IRON.

This iron is intended for all the purposes to which the old box and flat iron are applied. It may be heated at pleasure in three minutes, without any fire, and will remain hot at a nominal cost for any length of time.

Price from . . . . . 5*s.* 6*d.*

KENT'S PATENT ROTARY CINDER SIFTER. Extensively used also for mixing and sifting guano and other artificial manures.

The object of this invention is to render a disagreeable duty as little objectionable as possible. Its operation is most certain and effectual; the unsifted cinders being thrown into the upper part of the machine, a few turns of the handle separate the ashes from the cinders in the most perfect manner, without the least dust or dirt escaping from the sifter; the refuse falls into a movable box, and the cinders are actually deposited in the coal-scuttle without the possibility of loss by mixing with the ashes.

In houses limited for room, and especially those without yards or gardens attached, and in situations where cellars become the repositories of ashes and refuse, the machine becomes invaluable. The accumulation of rubbish under such circumstances is both disagreeable and unhealthy, and its removal to the dust-cart a source of considerable annoyance. The patent cinder sifter, however, happily removes these objections; it is a compact dust-bin in itself, and to remove the refuse it is only necessary to take away the box part of the machine which contains it: there is no dirt thereby occasioned, nor can any effluvium possibly arise.

Prices and dimensions:

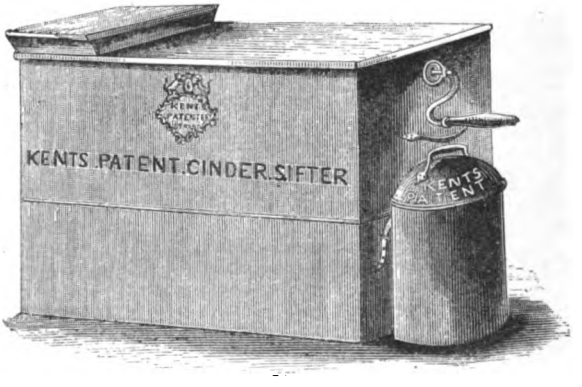
No. 1. 2 ft. 7 in. long, 1 ft. 3 in. wide, 3 ft. 3 in. high £3 3

No. 2. 2 ft. 10 in. long, 1 ft. 5 in. wide, 3 ft. 6 in. high £4 4

No. 3. 3 ft. 3 in. long, 1 ft. 7 in. wide, 3 ft. 9 in. high £5 5

No. 4. 5 ft. long, 2 ft. 4 in. wide, 2 ft. 7 in. high, Price £7 7

No. 4 consists of the upper portion or sifter only, expressly made for the use of large establishments, and is intended to stand on an ordinary dust-bin; it has, therefore, no ash-box or scuttle, the cinders falling on one side, and the dust on the other side of the bin.



CARPET SWEEPER. George Kent, wholesale agent to the patentee.

Consists of a neat japanned iron case or box, 12 in. long, having recesses for the dust, and a patent spiral self-adjusting brush. The dust, lint, and even hairs, pins, needles, &c. are taken up directly into the box and there retained as the sweeper moves along, instead of being accumulated, driven over the entire surface, and forced into the grain of the carpet, as is usual with ordinary brooms. It will sweep cleaner than brooms, with less injury to carpets, and without raising any lint or dust.

Price . . . . . 15*s.*

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KENT, GEORGE, *continued.*

KENT'S PATENT TRITURATING STRAINER.

The smallest size is about 13 in. by 9 in. and 12 in. deep, the upper part has a curvilinear bottom of white metal very finely perforated, and a brush with a lever handle working in centres, and made to traverse to and fro over this metal bottom, and by continuing this for a few minutes the whole of the ingredients for making soups, sauces, purees, gravies, jams, &c. are reduced to a fine pulp or liquid, and at the same time strained into a white earthen vessel which constitutes the lower part of the apparatus, thus superseding the tedious, troublesome, dirty, and expensive process with the hair sieve and tammy cloth, while the whole of the virtues of the ingredients employed are completely extracted, and brought to a superior consistency at a much less cost and in one-tenth the time usually occupied by those very primitive means.

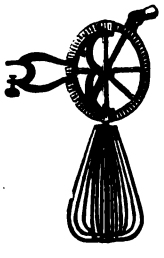
Size for families, 27*s.* 6*d.*; for hotels, 37*s.* 6*d.*

KENT'S ROTARY POTATO MASHER.

With this simple contrivance from 1 to 6 lbs. of potatoes can, by a few turns of the handle, be mashed more finely and perfectly than by any other means, and in less time than this brief description can be read. It is also adapted for grating bread with equal perfection and rapidity, as well as most other materials for culinary preparations generally.

Price from . . . . . 7*s.* 6*d.*

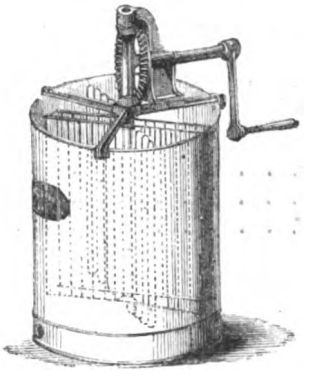
MEAT MINCING AND SAUSAGE-MAKING MACHINE, for mincing any kind or quantity of raw or cooked meat, and making sausages at one operation. Price, from 21*s.*



EGG BEATER (Monroe's patent), George Kent sole manufacturer.

This is on a somewhat similar principle to Griffith's whisk described above. By it small quantities of eggs, all kinds of egg mixtures, and batters, may in a few minutes be wrought up to a degree of lightness very far superior to anything that can be produced by the ordinary hand whisk.

Price . . . . . 5*s.*



GRIFFITH'S PATENT WHISK AND MIXING MACHINE, George Kent sole manufacturer.

This machine has two metal frames with a number of wire projections thereon which are made to rotate rapidly by suitable gearing in opposite directions around one centre. These frames work in a round vessel and are put in motion by a crank handle, and thus produce a greater amount of agitation than can be produced by the means hitherto employed. It was originally designed for cooks' and confectioners' purposes in beating up eggs and batters, which it does to the highest perfection in a very few minutes; it is however adapted and extensively used for a variety of other purposes as an agitator and mixer. These machines are made in various sizes, according to the purposes for which they are required, at prices varying from 21*s.* to £5.

CHURN (Griffith's patent). This is on the same principle as the whisk, and will bring butter quicker than any other churn extant.

Price from . . . . . 27*s.* 6*d.*

APPLE PARER, CORER, AND SLICER, for simultaneously paring, coring, and slicing apples.

By a simple adjustment it may be made to pare potatoes with great economy.

Price . . . . . 8*s.* 6*d.*

WATER FILTER (Danchell's patent), in various plain and ornamental designs, for house, ship, agricultural, and other purposes. G. Kent sole manufacturer.

These filters are on an entirely new principle, and possess the advantage of purifying as well as brightening the water. They also obviate the great difficulty experienced with all other filters, of cleansing when becoming foul or clogged, the filtering medium being contained in an earthen cylinder, which any servant may remove, purify, and replace in its original position in a few minutes. They are capable of yielding according to size from one to ten gallons per minute.

Price from . . . . . 8*s.* 6*d.*

CISTERN FILTERS on the principle described above, capable of filtering and purifying from 1 to 10 gallons per minute. Price from . . . . . 25*s.*

WATER TEST (Danchell's patent), George Kent sole manufacturer.

With this test any person without a knowledge of chemistry may detect the presence of any deleterious matter or impurities in water, and whatever it is found to contain the effect may be neutralized by the adoption of Danchell's patent filters.

Price with book of instructions . . . . 10*s.* 6*d.*

WATER SOFTENING APPARATUS (Danchell's patent), G. Kent sole manufacturer, may be applied to any cistern. It is self-acting, and renders the hardest water in its course from the service pipe perfectly soft.

Price £2 2

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KINGTON & TROWBRIDGE, 116 *Aldersgate Street, Corner of Long Lane, London, E.C.*—Platform and every description of weighing machines, scales, &c.

By appointment to Her Majesty's Honourable Board of War.

GILT BEAMS, of the best quality, 1*s.* 3*d.* per lb. from 30 lb. upwards, if fitted with boards and ropes or chains.

20 cwt.	£10 0 0
10 cwt.	7 0 0
5 cwt.	4 10 0

Second quality—RED PAINTED BEAMS, at 1*s.* per lb. from 25 lb. and upwards.

SOLID BRASS BELL WEIGHTS, stamped.

1 lb. to ¼ oz.	£0 5 6
2 lb. to ¼ oz.	0 8 6
4 lb. to ¼ oz.	0 15 0
7 lb. to ¼ oz.	1 6 0
14 lb. to ¼ oz.	2 10 0
Above 14 lbs. per lb.	0 1 6

N WEIGHTS, japanned and gilt, in sets, stamped.

4 lb. to ¼ lb.	£0 3 0
7 lb. to ¼ lb.	0 5 0
14 lb. to ¼ lb.	0 6 6
28 lb. to ¼ lb.	0 10 0
56 lb. to ¼ lb.	0 15 0

COPPER SCOOP MACHINES.

1, with scales, 7 in. wide	£0 10 6
2, ditto 8½ in. wide	0 13 0
3, ditto 10 in. wide	0 15 6
4, ditto 11 in. wide	0 18 6
5, ditto 12 in. wide	1 5 0

FLOUR OR POTATOE MACHINE.

3 ft. high, to weigh in sacks, 3 cwt.	£2 10 0
2 ft. 10 in. high, ditto 2½ cwt.	2 2 0
2 ft. high ditto 2 cwt.	1 15 0

PORTABLE MACHINE, mounted on wheels.

TO WEIGH.	PLATFORM.	
3 cwt.	22 by 20 in.	£2 18
4 cwt.	22 by 22 in.	3 8
5 cwt.	26 by 22 in.	3 18
7 cwt.	26 by 26 in.	4 15
10 cwt.	30 by 30 in.	5 10
12 cwt.	31 by 31 in.	6 10
15 cwt.	36 by 36 in.	7 10
20 cwt.	36 by 36 in.	10 15
30 cwt.	38 by 34 in.	12 10
40 cwt.	38 by 40 in.	15 0

MACHINE LEVEL WITH THE FLOOR, for warehouses.

TO WEIGH.	PLATFORM.	
20 cwt.	38 by 30 in.	£10 15
30 cwt.	38 by 34 in.	12 10
40 cwt.	38 by 40 in.	15 0

DOUBLE WEIGHING MACHINE, for corn, &c. to weigh off a man's back or barrow.

Best quality	£4 8 0
Second quality	3 10 0

MACHINE for seeds, hops, &c.

To weigh 2 cwt.	£2 10 0
To weigh 4 cwt.	3 15 0

This is one of the best and most useful machines made, and strongly recommended.

IRON FRAME MACHINE, for grocers, tallow chandlers, &c.

To weigh 3 cwt.	£3 5 0

SHIP SCALES to weigh coals,

Complete with weights	£13 5 0

WEIGHING MACHINES for family use, with oblong tin scale.

7 lb.	£0 9 6
14 lb.	0 10 6
28 lb.	0 12 6
40 lb.	0 14 6
56 lb.	0 18 6

REGISTERED FAMILY WEIGHING MACHINES, with weights complete.

No. 1	£0 16 6
No. 2	1 0 0
No. 3	1 6 0

FLOUR SCALES.

½ peck	£0 10 6
¾ peck	0 12 6
1 peck	0 15 6
½ bushel	1 2 0
1 bushel	2 0 0

DOUGH SCALES, 9*s.* 6*d.* per pair.

A list of every description of scales, weights, and weighing machines will be forwarded on the receipt of directed envelop to 116 Aldersgate Street, Corner of Long Lane, London, E.C.

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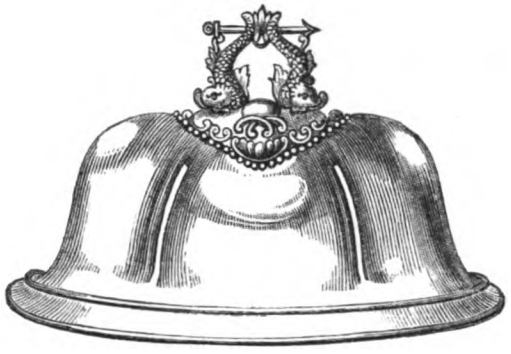
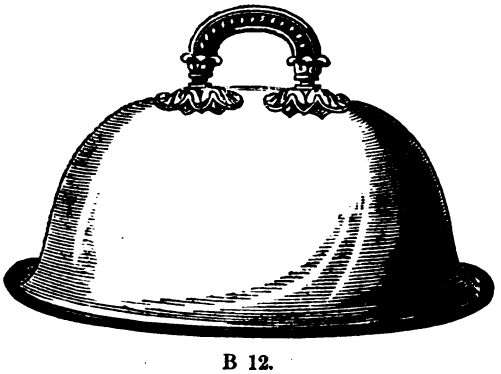
KNIGHT, MERRY, & Co., 131 *Bradford Street, Birmingham.*—General tin-plate articles.

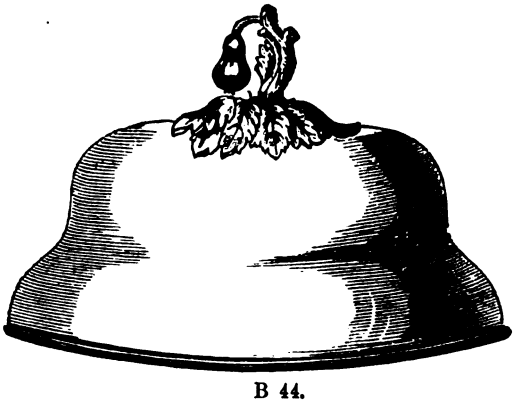


B 23.

B 33.



B 12.



B 44.

BEST BLOCK-TIN DISH COVERS—SILVER PATTERNS.

The UNIQUE COFFEE AND TEA URNS are strongly recommended to the public as possessing advantages over anything of the kind ever introduced.

The mechanical construction is so arranged that it is impossible for them to get out of order, and the various parts being movable ensure perfect cleanliness, and consequently purity of the article infused.

THE UNIQUE TEA AND COFFEE URNS.

The water being equally distributed over the tea or coffee, obtains perfect saturation and abstraction, requiring a smaller quantity than any other apparatus, and making the same better and in less time.

The price brings them within the means of every one.

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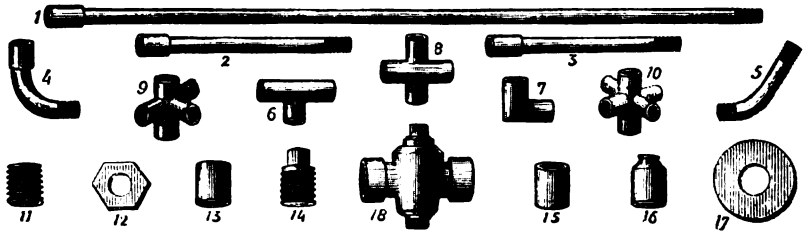
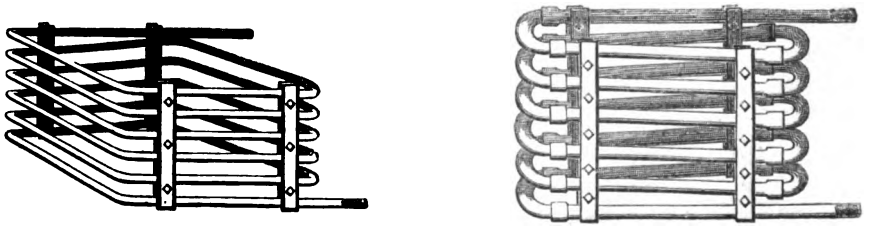
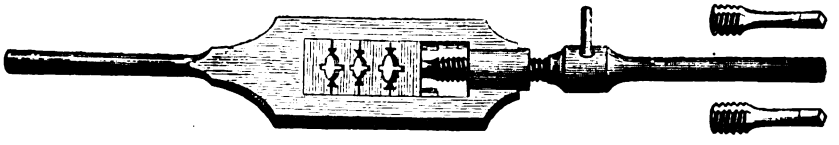
LAMBERT, BROTHERS, *Walsall, Staffordshire.*—Wrought-iron welded tubes; stocks, taps, and dies; iron and brass fittings; steam coils; sluice valves; chandeliers; metallic tubular bedsteads.



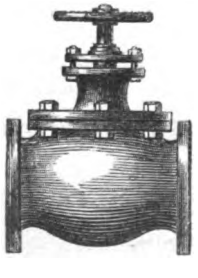
PATENT WELDED WROUGHT-IRON TUBES AND FITTINGS.



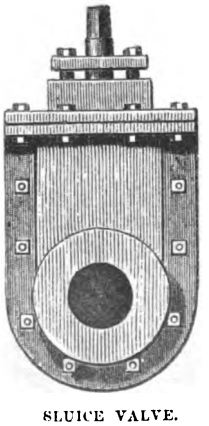
WROUGHT-IRON STEAM COILS.



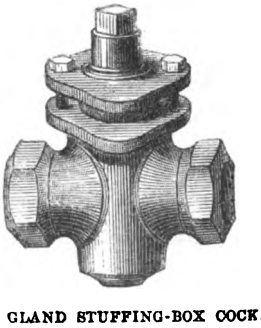
SET OF STOCKS, TAPS, AND DIES FOR IRON PIPE.



GLOBULAR STEAM VALVE.



SLUICE VALVE.



GLAND STUFFING-BOX COCK.

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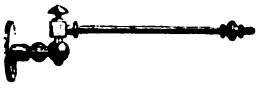
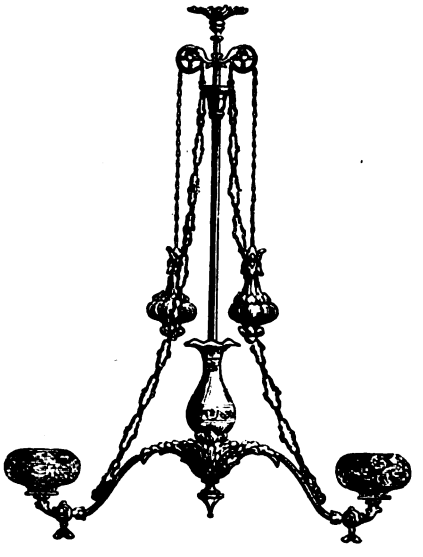
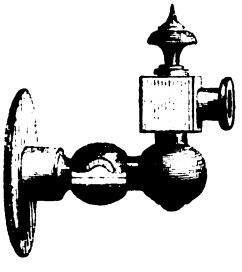
LAMBERT, BROTHERS, *continued.*



SINGLE GAS BRACKET.

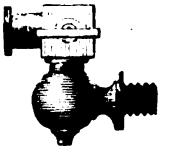


DOUBLE GAS BRACKET.

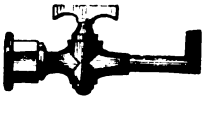


BRACKET BACK.

Two-light Hydraulic Pendant, £1 15*s.*



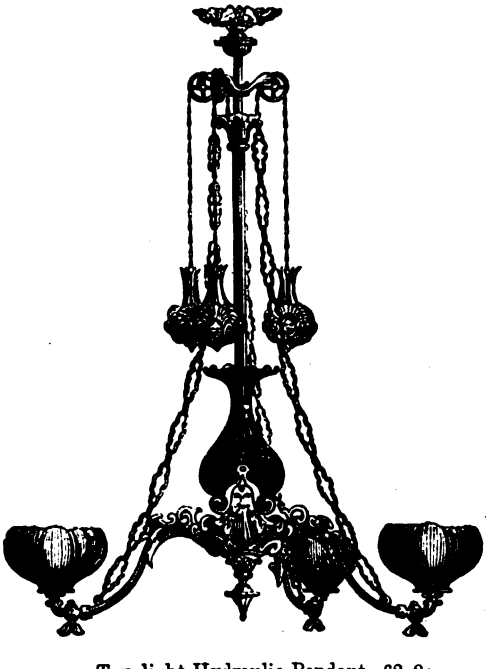
DOUBLE SWIVEL, WITH COCK JOINTS.



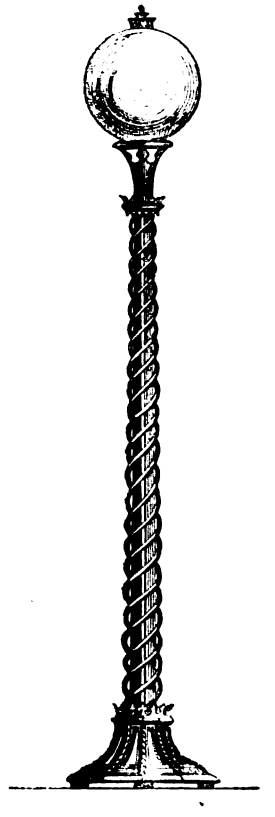
ELBOW LANTERN COCK.

SCREW-DOWN BIB COCK.

SCREW-DOWN STOP COCK.



Two-light Hydraulic Pendant, £2 2*s.*
Three-light ditto . . . . . £3 0*s.*



LAMP COLUMN, WITH SPIRAL TUBES.

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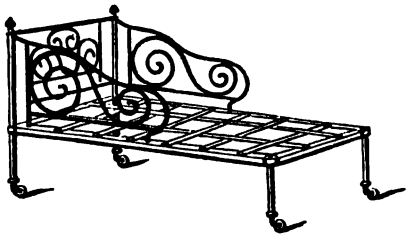
LAMBERT, BROTHERS, *continued.*



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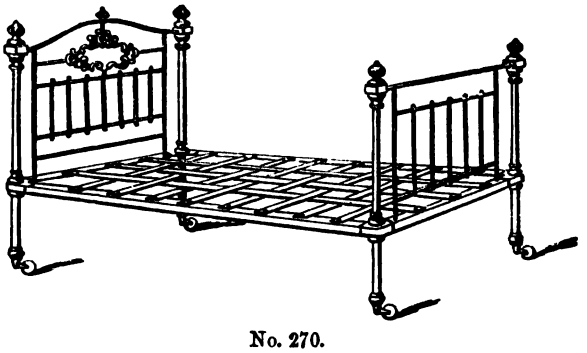

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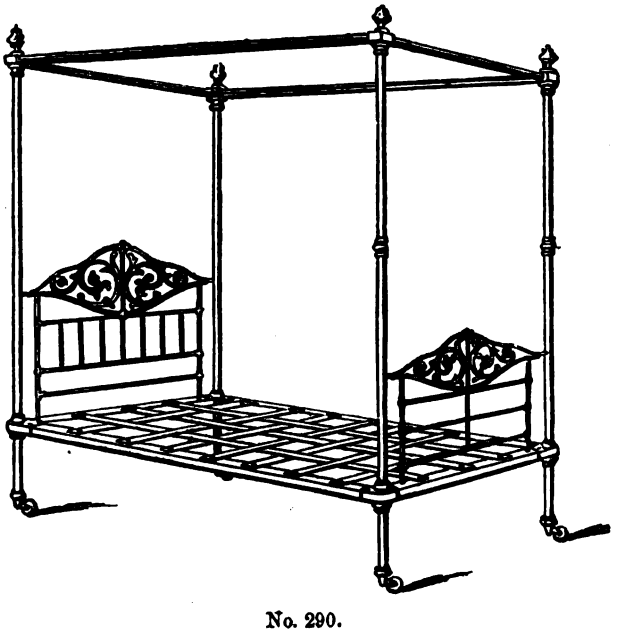

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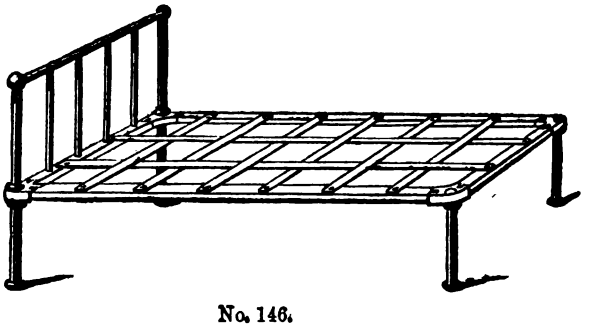
No. 132.



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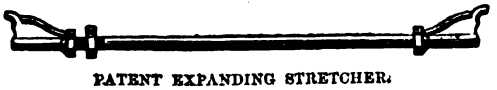

PATENT EXPANDING STRETCHER.

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[6140]

LLOYD, MARTIN, *Charles Henry Street, Birmingham.*—Malleable nails.

[6141]

LLOYD, THOMAS, & SONS, 15 *Old Street Road, Shoreditch, London.*—Steel mills.

Obtained First-Class Silver Medals in Boulogne, Vienna, and Amsterdam, 1856 and 1857.

Improved prize hand flour mills and dressing machines, to grind and dress at the same time, by hand.
No. 1 . . . . . £6 15
No. 2 . . . . . 8 15
Improved prize flour mills and dressing machines, to grind and dress at the same time, for horse or steam power.
No. 3 . . . . . £12 0
No. 4 . . . . . 15 0
No. 5 . . . . . 21 0
Improved corn grinding mills, for grinding barley, beans, peas, or oats, into fine meal, by hand. 4*l.* 5*l.* 6*l.* and £7 0
Improved barley mills, for grinding any kind of grain into fine meal, for horse or steam power. 10*l.* 12*l.* and £15 0
Improved corn crushers, for crushing oats and splitting beans or peas, 4*l.* 5*l.* and £6 0
Improved corn crushers, for horse or steam power, 8*l.* to 12*l.*
Drug mill, for grinding seeds for horse or cattle medicine, 1*l.* 15*s.* to £7 10
Handsome bronzed 4 pillar frame coffee mill in double bearings, with brass hopper, and 2 fly wheels, 14*l.* 20*l.* and £24 0
Handsome bronzed coffee mill, with brass hoppers, 2*l.* 2*s.* to £14 0
Pepper and spice mills, 1*l.* 1*s.* to 9 0
Improved sugar mills, 3*l.* 5*s.* to 6 10
Improved cocoa mills, 1*l.* 10*s.* to 20 0
Improved patent currant dressing and cleansing machine £4 10
Improved patent tea mills, 2*l.* 10*s.*, 4*l.* and . . 6 0
Patent sugar choppers, 16*s.*, 1*l.* 2*s.*, 1*l.* 8*s.*, 2*l.* and 2 4
Patent sausage machines, 1*l.* 1*s.*, 1*l.* 10*s.*, 2*l.* 2*s.*, and 3 3
Patent sausage machines, for sausage makers, asylums, public institutions, for mincing a large quantity. £7 7

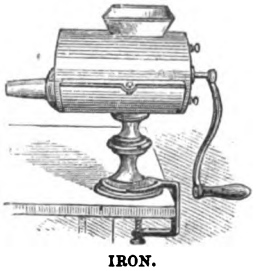
[6142]

LONGDEN & CO., *Phœnix Foundry, Sheffield.*—Cooking apparatus; mediæval fire-place; hot-air stove; stair balusters, railing, &c. (*See page* 60.)

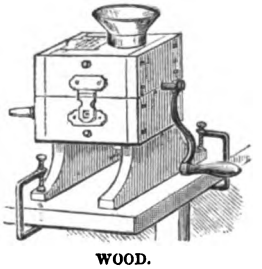
[6143]

LYON, A., 32 *Windmill Street, Finsbury, London.*—Sausage-making and general mincing machines, and small mincers to assist digestion.

Obtained two Medals at the Exhibition in Paris, 1855.



IRON.



WOOD.

Machine for family use, for making sausages, and general mincing purposes. Price £1 10
Machine for small shops, pastry cooks, &c. Price . £2 0
Machine for shops, hotels, pastry cooks, &c. . . 3 10
Machine for shops, hotels, institutions, &c. . . 6 6
Small mincer for the table, to assist digestion . 1 1
Small mincer with hot-water bottles, to keep food hot while being cut up to assist digestion. Price . £2 2
Machine for cutting meat for pies, &c. Price . 2 0
Machine for pulping vegetables for poultry . . 2 5
Machine for cutting French beans, vegetables, &c. 1 5
Improved knife and board for cutting bread for large establishments, schools, asylums, &c. Price 16/0.
Improved suet chopping knife and board. 4/0 to 8/6.

[6144]

MC CONNEL, ROBERT, *Glasgow.*—Improved locks, latches, and fastenings, for security; and others for common purposes, patented.

[6145]

MAC MORRAN, JOSEPH, 33 *Leicester Square, London.*—General mincing and sausage machines, and mills of various sizes.

[6146]

MANDER, WEAVER, & CO., *Wolverhampton.*—Aluminium casket, and aluminium in various forms.

[6147]

MANGER, JAMES, *Russell Street, Liverpool.*—One pair 30-inch double-action suction bellows with frame, complete.

[6148]

MAPPLEBECK & LOWE, *Birmingham.*—Kitchen ranges, stove grates, fenders, and fire-irons.

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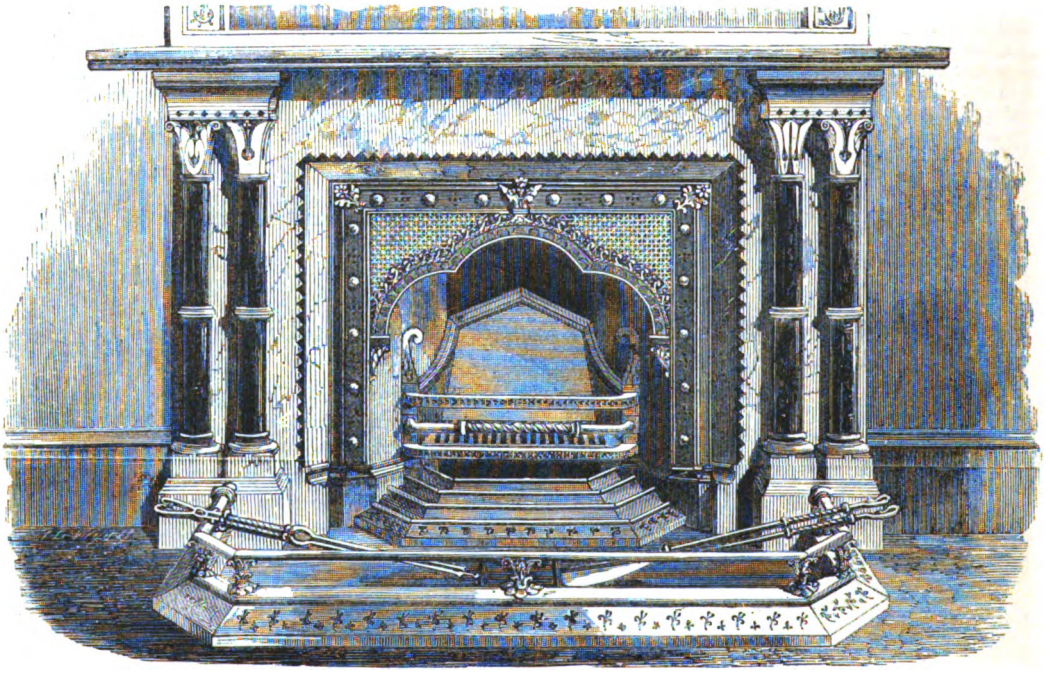
LONGDEN & Co., *Phœnix Foundry, Sheffield.*—Cooking apparatus; mediæval fire-place; hot-air stove; stair balusters, railing, &c.

DINING-ROOM FIRE-PLACE, being an adaptation of Early Pointed art to modern requirements, consisting of register grate of cast-iron electro-bronzed with copper, with brass ornaments and glass mirrors, ash-pan and fender of electro-bronzed cast-iron and steel, fire-irons of steel with electro-bronzed handles, and mantel-piece of Devonshire and serpentine marbles, designed by Messrs. Walton & Robson, architects, London and Durham.



DINING-ROOM FIRE-PLACE.

FRENCH RENAISSANCE HOT-AIR STOVE.

ORNAMENTAL PEDESTAL for enclosing hot-water pipes.

GOTHIC BED-ROOM GRATE with fire-lump sides and back, designed by Messrs. Walton & Robson.

A selection of STAIR BALUSTERS, TOMB RAILING, AND BALCONY RAILING in various styles.

OPEN-FIRE COOKING RANGE, with a raised cast-iron oven for baking or roasting, a wrought-iron lower oven for light baking, hot-hearth for boiling over the lower oven, plate-warmer over the upper oven, welded and galvanized wrought-iron boiler for circulation of hot water for a bath; open roasting fire, with sliding spit, racks, and polished kitchen fender.

[6149]

MARTINEAU, F. E., & Co., *Cleveland Street, Birmingham.*—Wrought iron and brass hinges.

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[6150]

MATHEWS, WILLIAM, 9 *Mount Street, Berkeley Square.*—Horse shoes, and shoeing hammer.

[6151]

MAXWELL, H. & Co., 161 *Piccadilly, W.*—Spurs and spur sockets.

[6152]

MAY, ALFRED, 259 *High Holborn.*—Gas roasting and baking oven, ranges, stewing stoves, linen drying closet, &c.

The exhibitor manufactures hydraulic rams, pumps, gas works, gas fittings, warming by hot water and hot air, cooking apparatus of every description. He also undertakes bell-hanging, and the erection and fitting of baths, improved closets for drying linen, hot and cold water for lavatories, dressing rooms, &c.

Mr. May has been extensively employed under Sir Joseph Paxton and other eminent engineers and architects in first-class gentlemen's mansions and public institutions in England, France, Germany, and Switzerland; and from his long practical experience of upwards of 30 years, is enabled to prepare plans and estimates suitable for public or private institutions. He will guarantee the efficiency of all works intrusted to him for execution. A large stock of apparatus is always kept on hand.

[6153]

MEDHURST, THOMAS, 465 *Oxford Street, London.*—Weighing machines.

[6154]

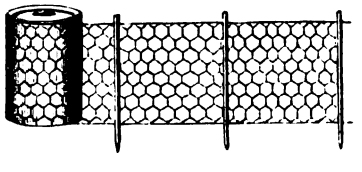
MILLS, JOSEPH, 40 *Great Russell Street, W.C.*—Register stove with patent door; range with shifting bars and improved dampers.

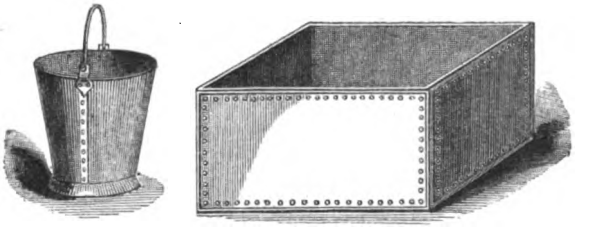
[6155]

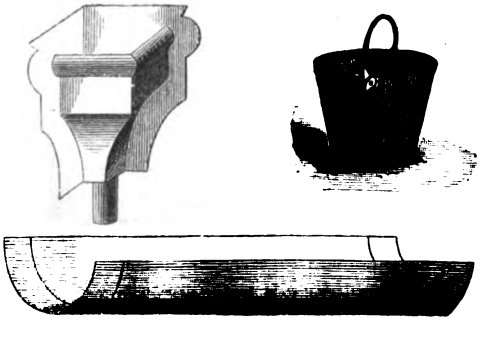
MORETON, JOHN, & Co., *Wolverhampton and London.*—Foreign and colonial hardware. (*See pages* 62 *to* 64.)

[6156]

MOREWOOD & Co., *Dowgate Dock, London, and Lion Works, Birmingham.*—Galvanized iron, manufactured and in sheets.







MOREWOOD & Co. manufacture the following, of which specimens are exhibited :—

Patent galvanized tinned iron, and galvanized iron, plain or corrugated, curved, and in tiles, of all gauges.

Black or painted corrugated iron, galvanized or black-cast gutters, pipe, &c. all of which are kept in stock.

Galvanized water and gas tubing, stamped and moulded gutters, wire, wire netting, nails, rivets, garden chairs, pails, &c.

Estimates given for roofs, and every description of galvanized buildings, at the offices and warehouse.

Morewood's patent continuous galvanized iron roofing is cheaper than felt. Full particulars may be learned on application.

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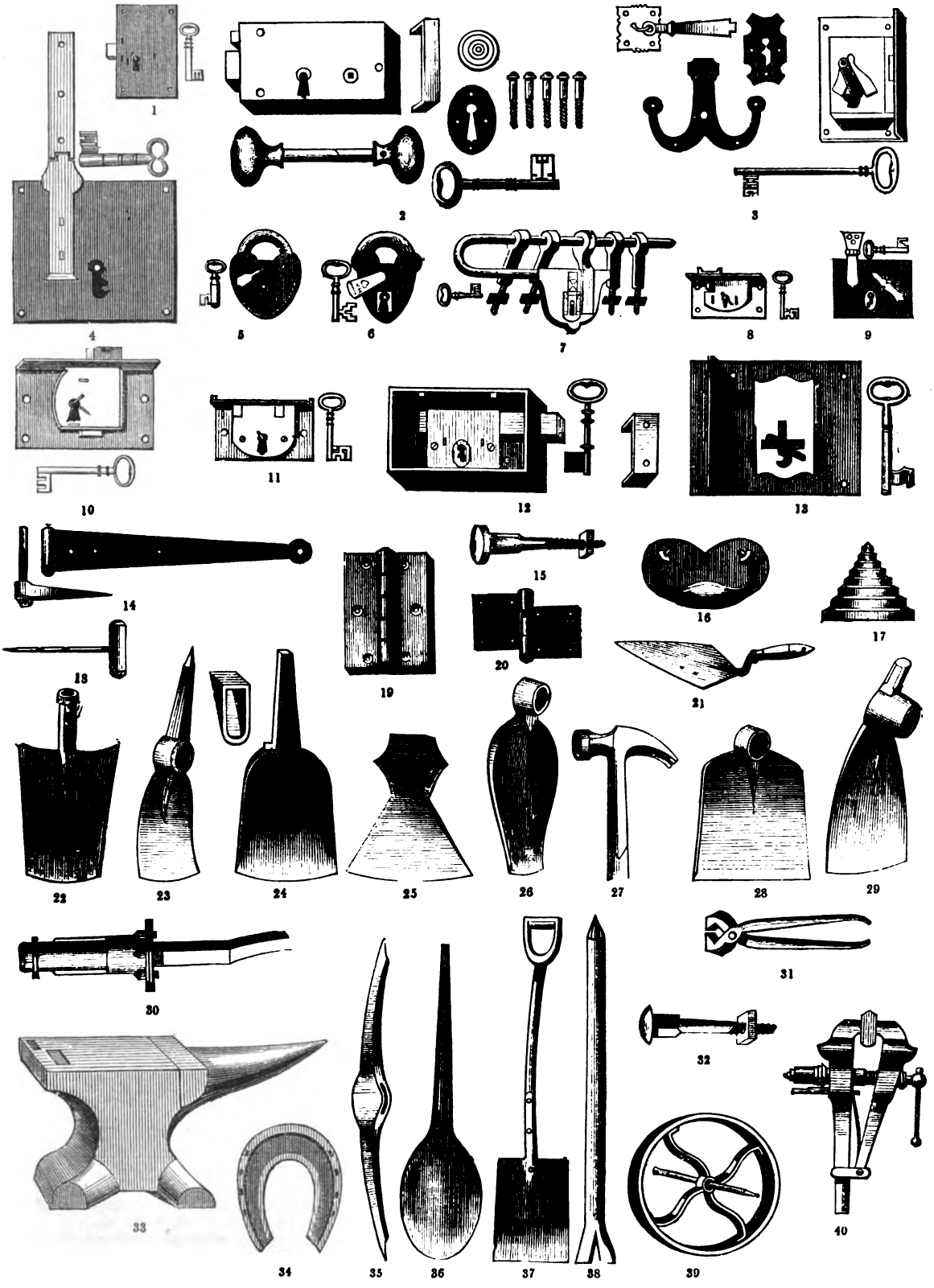
MORETON, JOHN, & Co. (late Moreton & Langley), *Wolverhampton, and 22 Bush Lane, Cannon Street, City, London, E.C.*—Foreign and colonial hardware.



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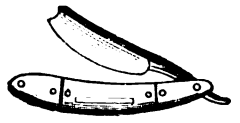
MORETON, JOHN, & CO., *continued.*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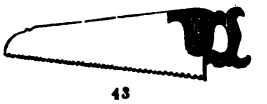
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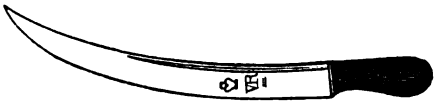
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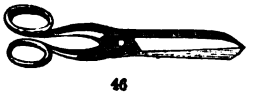
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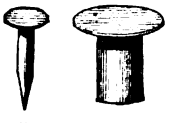
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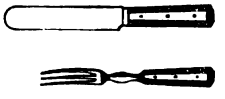
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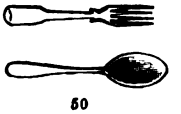
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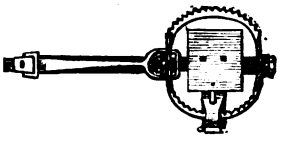
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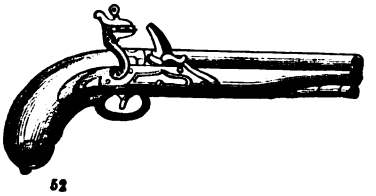
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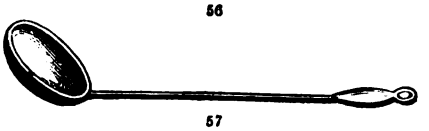
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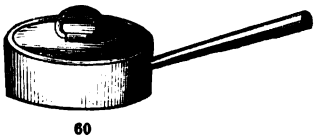
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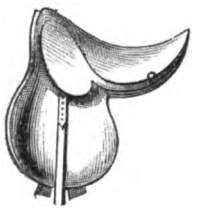
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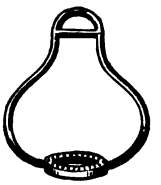
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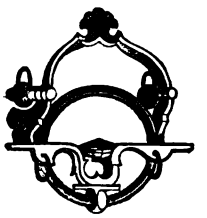
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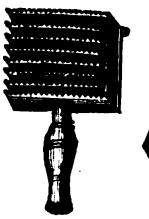
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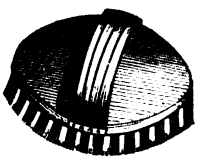
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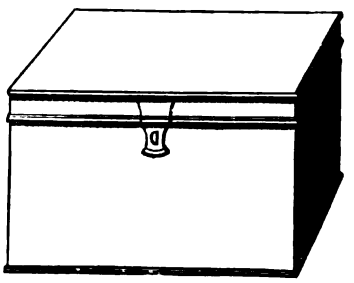
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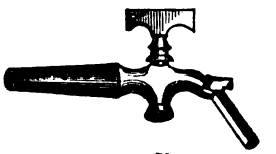
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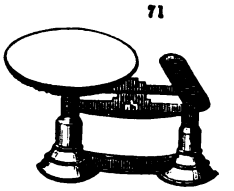
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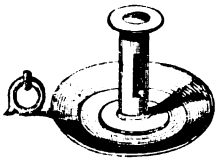
MORETON, JOHN, & CO., *continued.*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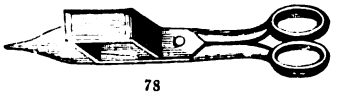
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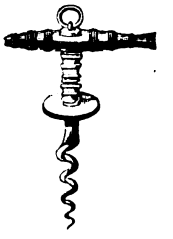
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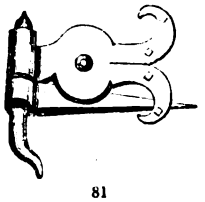
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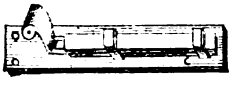
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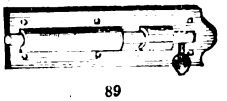
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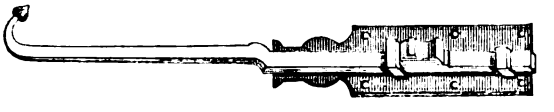
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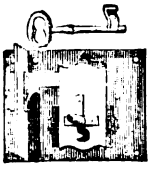
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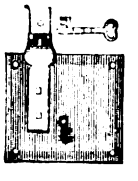
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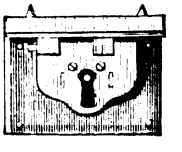
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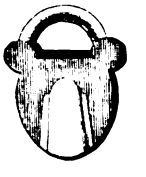
95

Anvils and vices.
Augers.
Awl blades.
Axes—every description.
Axles.
Balances, Salter's.
Bedsteads—iron and brass.
Bellows—house and smiths'.
Bells—dinner and tea.
,, house and yard.
Box irons and heaters.
Braces and bits.
Brass foundry.
,, cocks.
Britannia metal goods.
British plate goods.
Buckles.
Bullet moulds.
Butts—iron and brass.
Candlesticks—brass, &c.
Cash boxes.
Castors—iron and brass.
Chains and chain cables.
Chest handles.
Coach wrenches and screws.
,, bolts and nuts.
Coffin furniture.
Cooks' ladles.
Corkscrews.
Counter machines.
Cruet frames.
Curbs and bitts.
Curry combs.
Curtain rings.
Cut brads and tacks.
Cutlery—all descriptions.
Dog collars and chains.
Door springs and bolts.
Ewers and basins.
Fenders.
Fire irons.
Fish hooks.
Frying pans.
Galvanized iron
,, scoops and basins.
,, buckets, &c.
Garden rakes and tools.
German silver goods.
Gimblets.
Girths—saddle.
Gridirons.
Gun wadding.
,, implements.
Guns and pistols.
Hames.
Hammers.
Harness furniture.
Hat and coat hooks.
Head collars.
Helved hatchets.
Hoes—every description.
Hollow-ware—tinned.
,, enamelled.
Hooks and hinges.
Horse and mule shoes.
Iron mane combs.
,, pots and camp ovens.
,, dutch stoves.
,, safes.
Japanned goods.
Kaffir picks.
Kettles—sheet iron, &c.
Key rings.
Keys and blanks.
Lamps.
Lanterns.
Latches—Suffolk.
,, Norfolk.
,, bow and rim.
,, mortise.
,, night.
Lead ladles.
Leather goods.
Locks—dead.
,, mortise.
,, rim.
,, plate.
,, pad.
,, till.
,, chest.
,, cupboard.
,, trunk.
Malleable tacks.
Matchets.
Measuring tapes.
Mills—coffee, post, &c.
Nails—iron and brass.
Needles.
Percussion caps.
Pewter measures.
Pitch ladles.
Planes.
Platform machines.
Powder flasks.
Pulley blocks.
Pullies—frame and axle.
Rat and rabbit traps.
Rivets—iron and copper.
Rules—wood and ivory.
Sad irons.
Saddles and saddlery.
Sausage machines.
Scotch T hinges.
Swords and cutlasses.
Screws—iron and brass.
Shackles for chain cables.
Sheet brass and zinc.
Sheathing nails.
Ship scrapers.
Shot belts and pouches.
Singeing lamps.
Skewers.
Snuffers and trays.
Sofa springs.
Solder—tin and brass.
Spades and shovels.
Spittoons.
Spoons—all descriptions.
Spurs and spur rowels.
Stand scales.
Steelyards.
Stocks and dies.
Teapots.
Tin goods.
Toilet sets.
Traces—plough and cart.
Trays and waiters.
Trowels—garden and brick.
Wad punches.
Washers—iron.
Weights—iron and brass.
Wire goods.
Whips.
&c. &c. &c.

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[6157]

MORRISON, D., & Co., *Birmingham.*—Metallic furniture.

[6158]

MORTON, JOSEPH, & SON, *Bellfield Works, Sheffield.*—Stove grates, fenders, and fire-irons.

[6159]

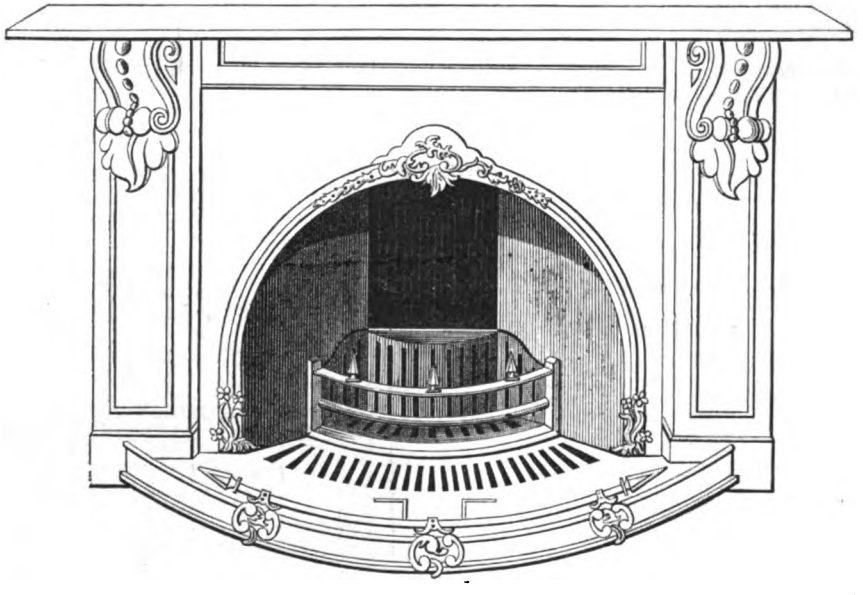
MUSGRAVE BROTHERS, *High Street, Belfast.*—Patent slow-combustion stoves; grates, patent iron fittings for stables, cowhouses, and piggeries. (*See page* 66.)

[6160]

NASH, RICHARD, *Ludgate Hill Passage, Birmingham.*—Presses, lathes, dies, tools, &c.

[6161]

NASH, SWAN, 253 *Oxford Street.*—Ranges, patent stoves and fuel.



JOYCE'S PATENT STOVE, manufactured by the exhibitor, is the only one that works without a flue. Price from 12/0 upwards. The prepared fuel for use with it, 2/3 per bushel.

The exhibitor's stock comprises: moderator lamps in great variety; a choice and elegant assortment of stove grates, fenders, and fire irons; an assortment of kitchen ranges and hot plates, with all the newest improvements, unsurpassed for lowness of price and excellence of quality; cutlery, electro-plated goods, gas chandeliers, and every description of furnishing ironmongery of the best quality, at the lowest prices.

[6162]

NASH & HULL, 202 *Holborn, W.C.*—Crystal glass, wood, and brass letters; stencil-plates.

Samples of the following are exhibited:—

WOOD LETTERS, gilt and painted, for facias, fronts of houses, public buildings, &c.

DECORATED GLASS LETTERS, for affixing on shop and office windows, show cases, doors, tablets, &c.

BRASS LETTERS in various patterns for the same purposes.

BRASS LETTERS for casters' patterns, monuments, tombs, &c.

LETTERING of various descriptions.

STENCIL PLATES for marking linen, packages, surveyors' and engineers' plans.

[6163]

NETTLEFOLD & CHAMBERLAIN, *Broad Street, Birmingham.*—Improvements in wood and metal screws, locks, and general iron work, introduced since 1851.

[6164]

NETTLETON, JOSHUA, 4 *Sloane Square, Chelsea.*—Open-fire ventilating stove and pan.

[6165]

NEVE, JOHN, & Co., *Union Works, Horselcy Fields, Wolverhampton.*—Cut nails, shoe bills, heel and toe tips, washers, &c.

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MUSGRAVE BROTHERS, *Ann Street Iron Works, Belfast.*—Patent slow-combustion stoves, patent stable fittings, cow-house fittings and iron piggeries.

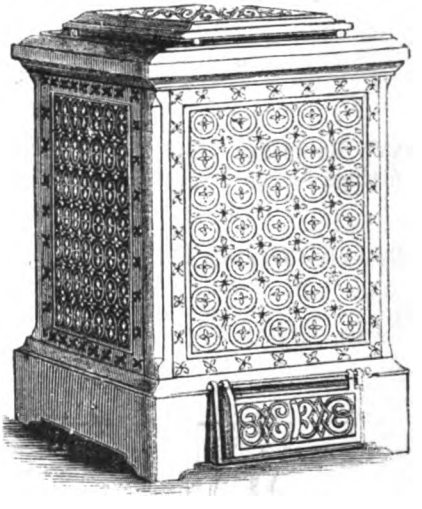
MUSGRAVE'S PATENT SLOW-COMBUSTION STOVE, exhibited Class XXXI. No. 6159 in Catalogue, is the nearest approach to heating by hot water, and a certain and economical means of procuring a genial and steady heat.

The power of burning day and night throughout the winter, at a uniform temperature, has caused this stove to be extensively used for entrance halls, schools, libraries, &c.

It can be fixed in churches with either upright or underground flue, and is so simple that an inexperienced person can manage it.

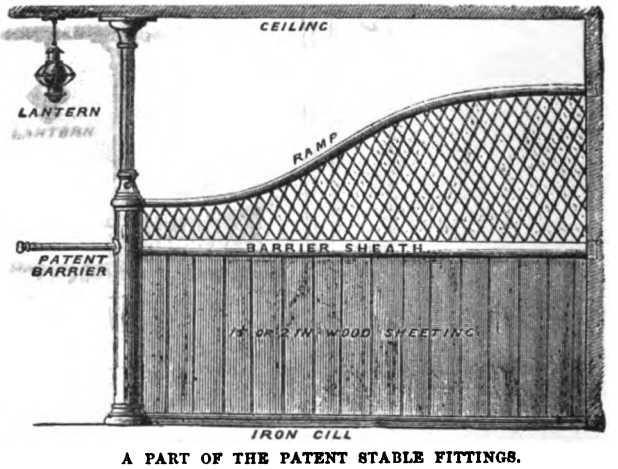
The interior of the stove is furnished with hot-air chambers, which draw the fresh air from outside the building, and thus secure perfect ventilation.

There is no oppressive smell, nor does it form those explosive gases so much complained of in other stoves.



PATENT SLOW-COMBUSTION STOVE.

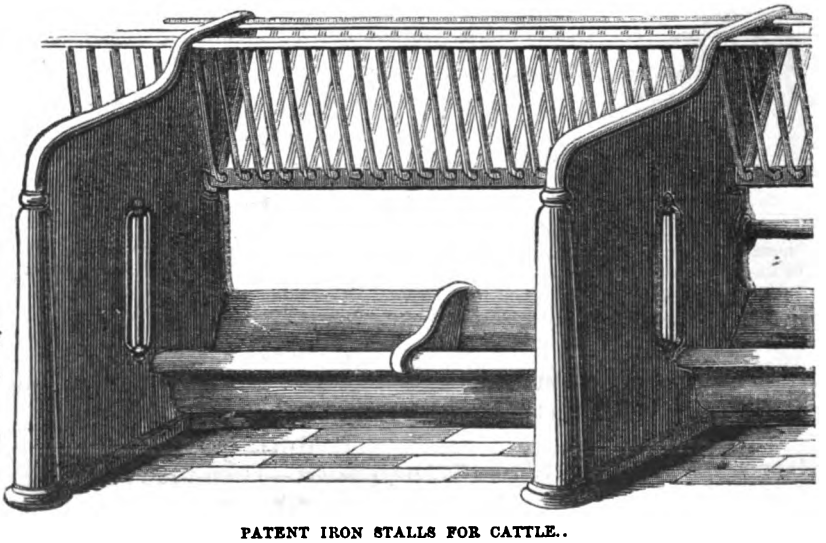
MUSGRAVE'S PATENT STABLE FITTINGS AND HARMLESS LOOSE BOXES, exhibited Class XXXI. No. 6159 in Catalogue, with tumbling manger and water pot, falling grid to prevent waste of hay, improved ventilator, sliding "barrier" to confine each horse to his stall in the event of breaking loose, and many other improvements deserving of inspection.



A PART OF THE PATENT STABLE FITTINGS.

MUSGRAVE'S PATENT IRON STALLS for cattle and IRON PIGGERIES and DOG KENNELS, exhibited Class IX. No. 2156 in Catalogue.

MUSGRAVE Brothers received, last season, for the foregoing inventions, the silver medals of the Royal Agricultural Societies of England and of Ireland, and the first prize at every competition where they have been exhibited.



PATENT IRON STALLS FOR CATTLE..

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[6166]

NEWTON, THOMAS, *Walsall, and* 84 *Long Acre, London.*—Steel bits, stirrups, spurs, chains, saddle harness, and carriage ironmongery.

[6167]

NICHOLAS, RICHARD, 32 *Water Street, Birmingham.*—Improved roasting-jack with key attached.

[6168]

NICHOLSON, WILLIAM NEWZAM, *Trent Iron Works, Newark.*—Cooking range, cottage stoves and fittings, and decorative iron work.

[6169]

NOCK & PRICE, 9 *Union Passage, Birmingham.*—Improved gas cooking range. (*See page* 68.)

[6170]

NYE, S., & Co., *Wardour Street, Soho.*—Patent mincing sausage machines, masticators, and coffee mills. (*See page* 69.)

[6171]

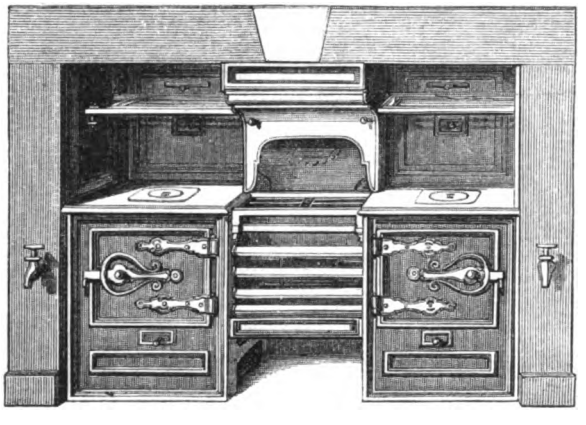
ONIONS, JOHN C., *Bradford Street, Birmingham.*—Portable forge; smith's, house, and fancy bellows; anvil and fire irons.

[6172]

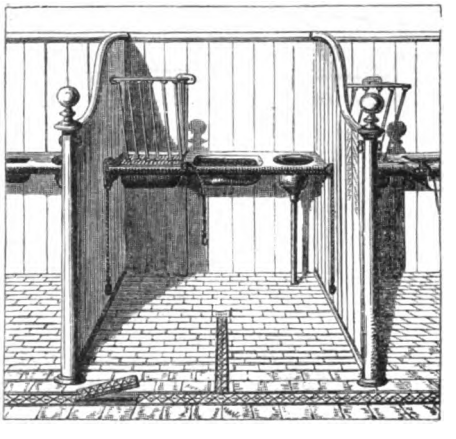
OTTLEY, THOMAS, 59 *Spencer Street, Birmingham.*—Gold, silver, and bronze medals.

[6173]

OWEN, WILLIAM (late Sandford & Owen), *Phœnix Works, Rotherham.*—Bradley's patent kitchener; improved registered stable fittings.



PATENT KITCHENER.



STABLE FITTINGS.

BRADLEY'S PATENT KITCHENER, which possesses all the advantages of the ordinary close-fire kitchener, in having excellent hot plates on top of oven or ovens, for boiling, steaming, and stewing, with the additional advantage of having a thoroughly effective and deep open fire for roasting purposes.

The principle of heating is self-acting, and a great saving of fuel is effected.

References in testimony of its advantages can be given.

IMPROVED REGISTERED STABLE FITTINGS, consisting of hay rack and seed box, tubular tying apparatus, manger, water-pot, &c.

These fittings have been designed expressly to meet the following requirements—

1. Of uniting strength with lightness of appearance.
2. Of preventing possibility of accident to the animal placed in them.
3. Of avoiding all waste in food.
4. Of cultivating cleanliness and comfort.
5. Of being simply and inexpensively fixed.

[6174]

PALMER, JOHN, & SONS, *Beech Lanes, near Birmingham.*—Screw railway wrenches, screw and fixed spanners, hammers, &c.

[6175]

PATENT ENAMEL COMPANY, 288 *Bradford Street, Birmingham.*—Glass enamelled hollow ware and patent tablets for street names, &c. (*See page* 70.)

[6176]

PERRY, THOMAS, & SON, *Bilston.*—Metallic bedsteads, fire-proof and thief-resisting safes.

BOCHES MUSEUM MANC

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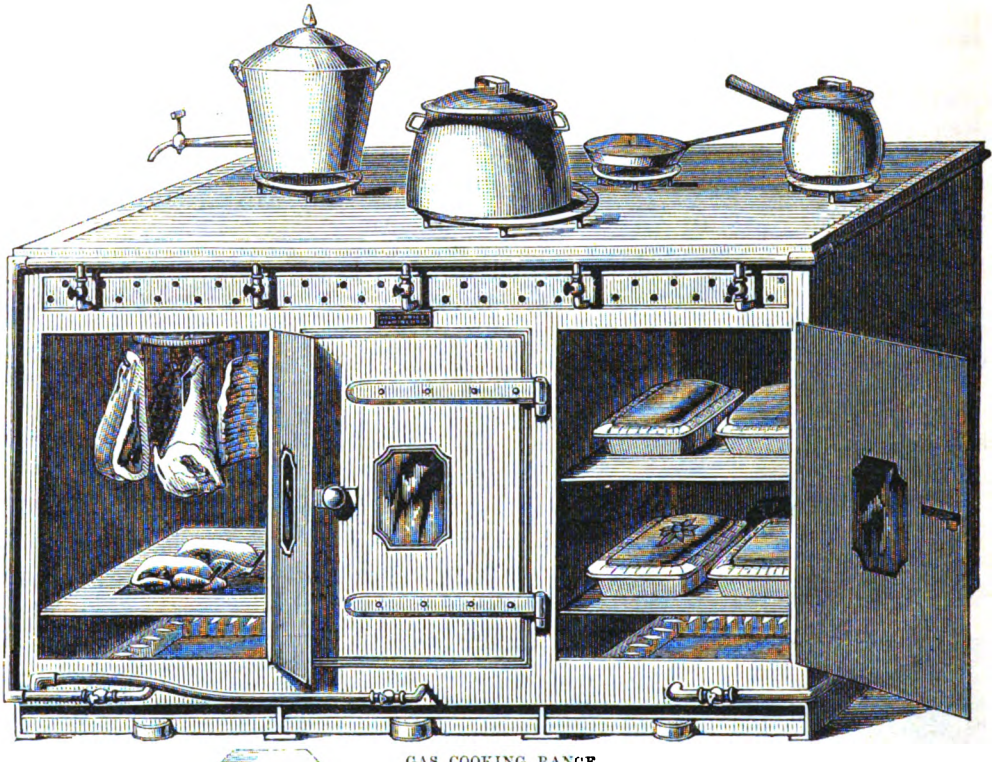
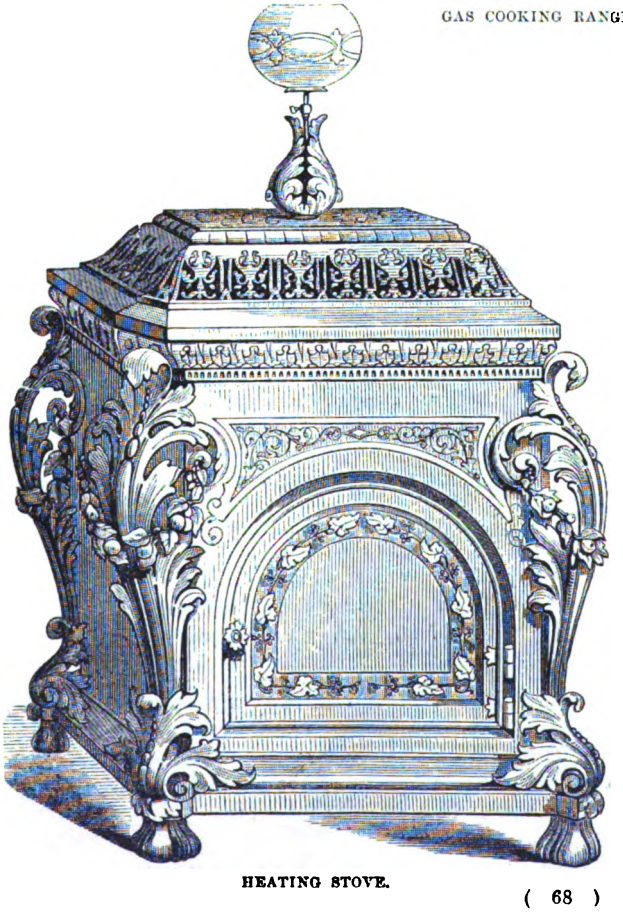
NOCK & PRICE, 9 *Union Passage, Birmingham.*—Improved gas cooking range.



GAS COOKING RANGE.



HEATING STOVE.

IMPROVED GAS COOKING AND HEATING STOVES.

Meat cooked by gas takes less time than by ordinary fire, browns beautifully, and requires no attention. It is more nutritious, full of gravy, tender, and of superior flavour. Pastry can be baked by the same means in a superior manner, at a saving of 40 per cent. in cost and labour.

The exhibitors manufacture every description of gas cooking and heating stoves. Drawings and price lists will be sent on application.

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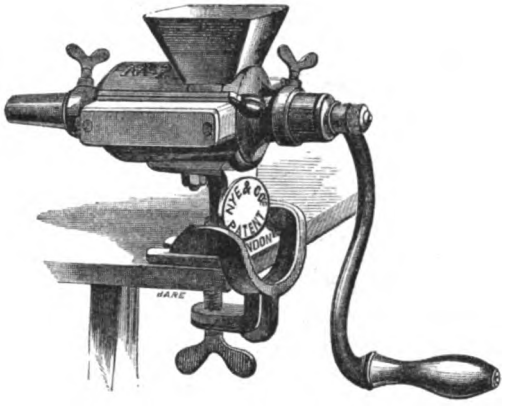
NYE, S., & Co., *Wardour Street, Soho.*—Patent mincing sausage machines, masticators, and coffee mills.

Obtained a Prize Medal at the Paris Exhibition, 1855.

These machines are intended for mincing and mixing various substances—meat or vegetables for soups, &c.; fruit for mincemeat; suet for pastry; and for making potted or forced meats; also for preparing a great variety of dishes.

For sausages, they mince, mix, and force into the skins at the same time, and are admirably adapted for reducing meats for soups, according to the mode recommended by Professor Liebig, in his work on "The Chemistry of Food."



THE SAUSAGE MACHINE.

Their economy and efficiency are so great, and they are so well adapted for the kitchen, that they only require to be known to secure their general adoption.

"Among other objects in the show worthy of special notice, we may mention the very ingenious mincing machine, exhibited by Nye & Co. It is extremely clever, and for the mechanical skill which it displays, is eclipsed by nothing in the whole show."—*Times, July* 14, 1853.

"This is a little thing every husband ought to carry home to his wife, who, we are satisfied, will turn it to the best account, and save the price."—*Mark Lane Express, August* 15, 1854.

Price £1 10*s.* £2 2*s.* £3 3*s.* and £7 7*s.*

A SMALL MINCER for the dinner table, to assist digestion, loss of teeth, &c. Price £1 10

This machine is very neatly got up, and may be screwed on the dining table without even injuring the cloth. It is intended for mincing food for persons who cannot masticate properly. It is made hot, and meat, &c. is rapidly minced. To invalids, and to those who in order to preserve health are obliged to have their food thoroughly minced, this machine is invaluable.

"12, *Norfolk Villas, Westbourne Grove, Bayswater.*

"I have had one of your mincing machines for the dinner table in use for some time, and find it everything that could be wished. We have had masticators containing several knife-blades in one handle, but your invention is vastly superior. I recommend it to all my friends who suffer from indigestion. Yours obediently,

"To Messrs. Nye & Co." "S. SAUNDERS.

By Her Majesty's Royal Letters Patent.

NYE'S PATENT IMPROVED MILLS, for coffee, pepper, spices, &c.

These mills are most conveniently arranged for domestic use, being provided with a cramp, by which they are fixed to the table or any other convenient place in an instant, and as quickly removed. By a nice and safe arrangement the grinding surfaces cannot possibly touch each other, being provided with a regulating screw, by means of which they are set to grind fine or coarse, as desired. They grind very rapidly, and are the most convenient mills ever offered to the public. Families using these mills avoid adulteration, and secure a genuine article.

Prices: No. 1, 8*s.*; No. 2, 10*s.*; No. 3, 14*s.*; No. 4, 20*s.*

TESTIMONIALS.

"GENTLEMEN,—It affords me great pleasure to add my testimony to the merits of your truly useful mincing machine, which I have now had in constant use for the last twelve months. Its performance surpasses all my expectations of it, and its great utility is only exceeded by its simplicity.

"I have already recommended the machine to many of my friends, and it will afford me much pleasure to satisfy any person as to its great efficacy, and you have my full permission to refer any one to me for that purpose.

"CHARLES GURDEN,
"*Chief Cook to the Honourable Society of the Middle Temple.*"

"60, *Tower Street, Westminster Road.*

"GENTLEMEN,—I have had your mincing machine for the last sixteen months, doing all the sausage-making for my business as a pork butcher, and am glad to say I cannot praise it too highly; it is a great saving of time, and has given me the greatest satisfaction.

"I am, gentlemen, yours, &c.
"To Messrs. Nye & Co." "J. WILSON.

"*Agricultural Department, Baker Street Bazaar.*

"SIR,—In reply to your inquiry respecting the character of your machine for mincing and sausage making, I beg to say that in all the quantity I have sold, I have never had a complaint of any kind, but in every instance in which I have made the inquiry I find they have given the greatest satisfaction; the simplicity of construction, superior workmanship, and, above all, the material of which they are composed, render them particularly clean and wholesome, and not liable to derangement.

"I am, yours respectfully,
"To Messrs. Nye & Co." "M. MEDWORTH, *Manager.*

"11, *Castlenau Villas, Barnes, Nov.* 18, 1854.

"GENTLEMEN,—In reply to your note of the 11th inst. I have great pleasure in saying that after two months' trial of your excellent patent mincing machine, I can confidently recommend it, fully answering, as it does, all the purposes you describe in your prospectuses; and I feel assured, were it more generally known, few families would be without one. Wishing you all the success the invention merits,

"I am, gentlemen, your obedient servant,
"To Messrs. Nye & Co." "R. WEDGEWOOD.

"*Refreshment Department, Western Area, Messrs. F. E. Morrish & Co. Contractors, Exhibition Building, South Kensington, May* 24, 1862.

"GENTLEMEN,—So far as our experience extends as to the utility of your Patent Mincing Machines, of which we have two in use, we have no hesitation in stating that we find them to answer the purpose in every respect.

"We are, gentlemen, yours obediently,
"To Messrs. S. Nye & Co." "F. E. MORRISH & Co.

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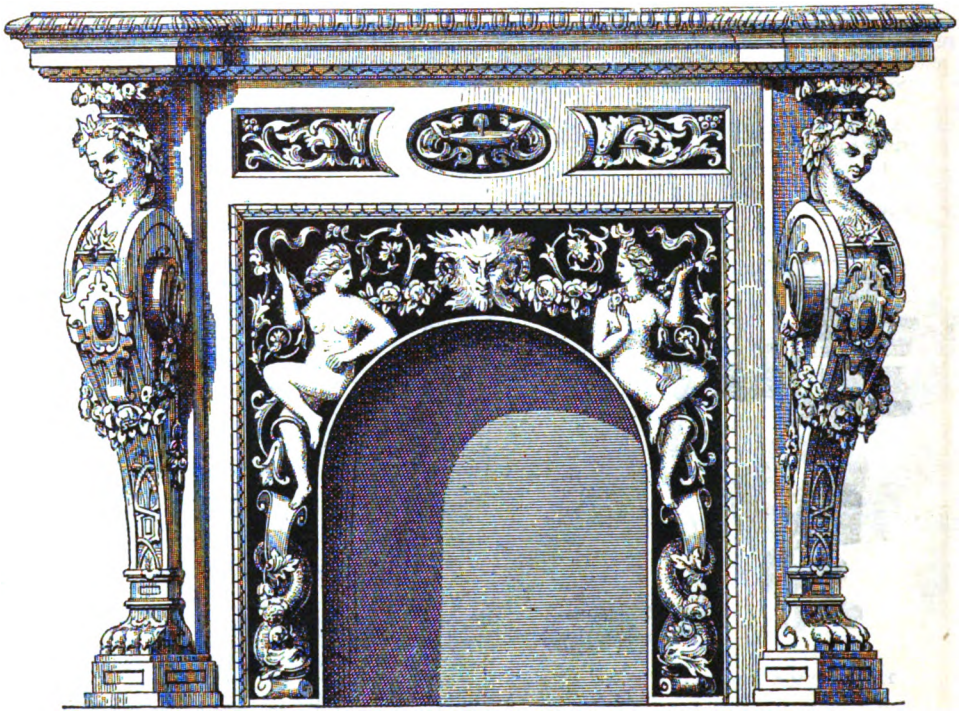
PATENT ENAMEL COMPANY, 288 *Bradford Street, Birmingham.*—Glass enamelled hollow ware and patent tablets for street names, &c.



GRATE FRONT.

1. GRATE FRONT, in Limousine enamelled iron.

2. ALTAR FRONTAL, in Limousine enamelled iron, style of the 15th century.

3. PANELS AND FRIEZE, in Limousine enamelled iron, for exterior decorations of buildings.

4. ORNAMENTAL PANEL of Limousine enamelled iron, for bedsteads.

5. PANELLING of Limousine enamelled iron, for state cabin, &c.

6. Indestructible tablets for shop signs, door numbers, street name-plates, &c.

ALTAR FRONTAL.

7. SPECIMENS OF TABLE WARE, made of wrought-iron enamelled and printed in imitation of earthenware.

8. UTENSILS for culinary and domestic use.

9. CAST-IRON TUBES, for conveying gas or water, rendered incorrodible by enamel.

The whole of these specimens are made of wrought-iron rendered incorrodible by the process of enamelling, by which they are covered with a hard, vitreous surface, into which the colours are fused or burnt at a high temperature, so as to be perfectly unalterable by exposure to the atmosphere or weather for any length of time.

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[6177]

PEYTON & PEYTON, *Bordesley Works, Birmingham; London Warehouse,* 49 *Long Acre, W.C.; City Office,* 46 *Moorgate Street, E.C.*—Metallic bedsteads; hat and umbrella stands of wrought and cast iron combined.

PATENT IRON HALF-TESTER BEDSTEAD. (No. 5.)

1. CHILD'S COT, japanned.

IRON BEDSTEADS.

2. PATENT SOLID IRON FRENCH BEDSTEAD, japanned and relieved, with improved dovetail joints to tighten the lath bottom; size, 3 ft. by 6 ft. 6 in.
3. PATENT IRON HALF-TESTER BEDSTEAD, japanned and relieved, improved dovetail joints to tighten the lath bottom; the pillars of parallel tube and ornamental castings; size, 3 ft. 6 in. by 6 ft. 6 in.
4. PATENT IRON HALF-TESTER BEDSTEAD, richly japanned and relieved with gold, improved dovetail joints (the same as in No. 3), the pillars composed of taper tube and massive ornamental castings; size, 5 ft. by 6 ft. 6 in.
5. PATENT IRON HALF-TESTER BEDSTEAD, the same as No. 4, but japanned to imitate walnut wood.

IRON BEDSTEADS, BRASS MOUNTED.

6. PATENT IRON FRENCH BEDSTEAD, japanned, the pillars of parallel tube, mounted with brass, the head and foot rails with brass ornaments to correspond, improved dovetail joints (the same as in No. 3), size, 3 ft. 6 in. by 6 ft. 6 in.
7. PATENT IRON HALF-TESTER BEDSTEAD, japanned, improved dovetail joints (the same as in No. 3), the pillars of taper tube, mounted with brass, the head and foot rails with brass ornaments to correspond; size, 4 ft. 6 in. by 6 ft. 6 in.
8. PATENT IRON TESTER BEDSTEAD, japanned, the pillars of parallel tube, mounted with brass, the head and foot rails with brass ornaments to correspond, improved dovetail joints (the same as in No. 3), size, 3 ft. 6 in. by 6 ft. 6 in.

BRASS BEDSTEADS.

9. PATENT BRASS HALF-TESTER BEDSTEAD, the pillars composed of patent taper tube, and with the rails and cornice of elaborate cast work, wrought and burnished; new patent elastic bottom; size, 5 ft. by 6 ft. 6 in.
10. PATENT BRASS FOUR-POST BEDSTEAD, with canopy and coronet, the pillars of parallel tube, improved dovetail joints (the same as in No. 3); size, 4 ft. 6 in. by 6 ft. 6 in.
11. PATENT BRASS FOUR-POST BEDSTEAD, with canopy and coronet, pillars of patent taper tube, with richly wrought ornaments, the head and foot rails and coronet to match; size, 5 ft. by 6 ft. 6 in.
12. BRASS STRETCHER OR CAMP BEDSTEAD; width, 2 ft. 10 in.

IMPROVED HAT STAND, of wrought and cast iron combined.

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[6178]

PHILLIPS, THOMAS, 55 *Skinner Street, Snow Hill, London.*—Gas bath, gas cooking apparatus, stoves, &c.

[6179]

PHILLIPS, G., 27 *Featherstone Street, City Road.*—Locks and fire-proof depositories, cheap, safe, and elegant.

[6180]

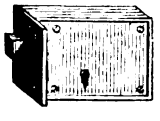
PIERCE, WILLIAM, 5 *Jermyn Street, London.*—Ornamental stove grates and fenders for drawing rooms, &c.; pyro-pneumatic stove grate for churches, &c.; fire-lump grates for cottages.

[6181]

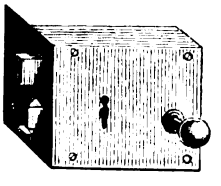
PIGOTT & CO., *London, and St. Paul's Square, Birmingham.*—Buttons, ornaments, medals, shirt studs, sleeve links, clasps, solitaires, &c.

[6182]

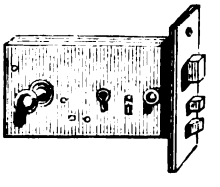
PLIMLEY, J. T., & CO., *Wolverhampton.*—Locks and general ironmongery.



RIM DEAD TO LOCK ON BOTH SIDES.

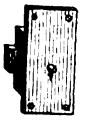


THREE-BOLT HALL DOOR.

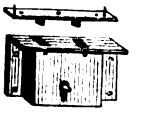


MORTISE THREE-BOLT.

TILL OR DRAWER.



STRAIGHT CUPBOARD.



BOX, CHEST, OR SLOPING DESK.

PAD.

Patterns may be seen and prices furnished for all kinds of hardware suitable for the East and West Indies, North and South America, Africa, and other foreign markets, as also a general assortment for the home and colonial trades, including anchors, anvils, augers, axles, battery pans, bells, boilers, bolts, brass work, brushes, bellows, cast-iron goods, coffee mills, chain, coach screws, copper goods, cart springs, crowbars, cannon, elliptic springs, fuze, frying pans, fenders, fire irons, files, flesh forks, guns, grindstones, gridirons, hammers, hinges of all kinds, hames, harness, jacks, keys, kibbling mills, locks of all kinds, ladles, latches of all kinds, matchets, muskets, nails (cut and wrought), picks, pots, (three-legged), planes, pistols, rivets, spades and shovels, screws, sad irons, traps, tue irons, tin goods, wire of all kinds, weights, and every other article connected with the hardware trade.

[6183]

POTTER, THOMAS, 44 *South Molton Street.*—Bronzed castings, and wrought-iron work.

[6184]

POUPARD, WILLIAM, *Blackfriars Road, London.*—Patent curvilinear beam weighing machine; imperial machine, spirometer balance, and safety wheel skid, &c.

The following are exhibited:—

1. IMPERIAL WEIGHING MACHINE TRANSVERSE COMPOUND LEVER, showing action, for weighing coals or any stipulated weight where portability or space is required.
2. Compensated curvilinear beam WEIGHING MACHINE.
3. ditto ditto ditto VAN ditto
4. Compensated curvilinear beam RETAIL COAL MACHINE.
5. ditto ditto ditto ditto (part inverted).
6. SPIROMETER BALANCE in connexion with Dr. Hutchinson's spirometer.
7. Patent safety curvilinear WHEEL SKIDS.

[6185]

PRICE, CYRUS, & CO., *Hursley Fields, Wolverhampton.*—Double-action detector locks; gunpowder fire-proof safes.

The exhibitors are the patentees and manufacturers of the gunpowder-proof double-action detector locks, and gunpowder, fire, and thief proof safes.

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[6186]

PRICE, GEORGE, *Cleveland Works, Wolverhampton.*—Wrought-iron fire-resisting safes, chests and doors; cabinet, rim, and mortise locks. (*See pages* 74 *to* 77.)

[6187]

PULLINGER, COLIN, *Selsey, Sussex.*—Traps for mice, rats, &c.; each one caught resetting the trap.

[6188]

RADCLYFFE, THOMAS, *Leamington.*—Kitchen ranges; smokeless feeding screw for ditto.

[6189]

RAWLINS, EDWARD, 27 *Whittall Street, Aston, Birmingham; Works, Thimble Mill Lane Aston.*—Stampings and pressings of iron and steel for a variety of purposes.

[6190]

REDMAYNE & Co., *Wheathill Foundry, Rotherham.*—Stove grates, fenders, hat and umbrella stands, and fountains.

[6191]

REYNOLDS, JOHN, *Crown and Phœnix Works, Birmingham.*—Nails, tacks, brads, bills, washers, brackets, hooks, &c.

Obtained a Prize Medal at the Exhibition of 1851.

These Works have been established nearly half a century, for the manufacture of every description of patent cut nails, tacks, brads, and shoe bills, of best make and material, in copper, brass, zinc, and iron; also cornice fasteners and brackets, pressed hinges, washers, &c.

[6192]

REYNOLDS, JOHN, 57 *New Compton Street, W.C.*—Wire work, useful and ornamental, and patent metallic netting.

[6193]

RHODER, WILLIAM, *Westgate, Bradford.*—Indestructible fireproof safe.

[6194]

RICHARDS, HENRY, 36 *St. James' Place, Liverpool.*—A metallic meat safe.

[6195]

RICHARDS, W. & Co., *Imperial Wire Works,* 370 *Oxford Street.*—Wire work.

The exhibitors manufacture all kinds of ornamental wire-work.

They exhibit the following specimens:—

Pheasant aviaries.
Rose temple flower baskets.
Flower stands.
Garden seats.
Flower boxes, &c.

[6196]

RICKETS & HAMMOND, 5 *Agar Street, Strand.*—Gas range and gas stoves, gas globe light, and ventilator.

[6197]

RIDDELL, JOSEPH HADLEY, 155 *Cheapside, London.*—Patent slow-combustion boiler for heating by the circulation of hot water.

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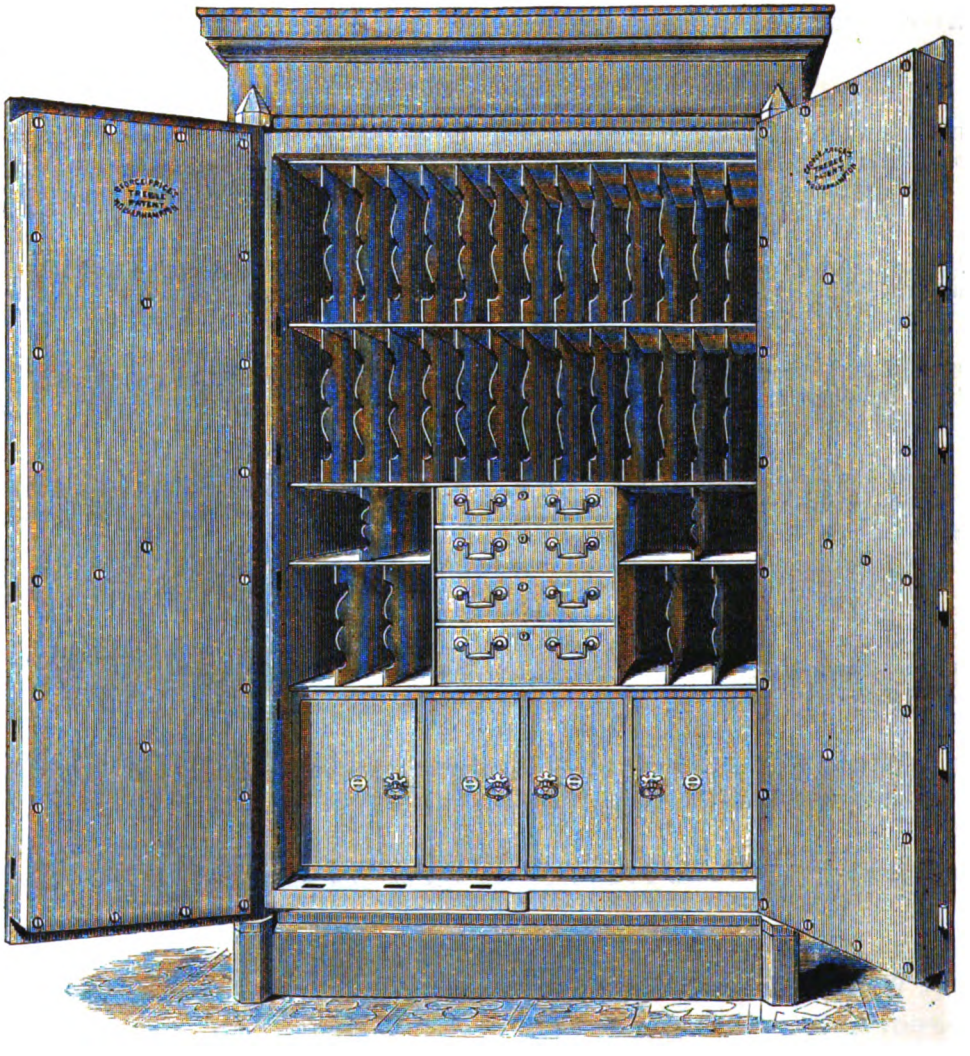
PRICE, GEORGE, *Cleveland Safe and Lock Works, Wolverhampton.* London Agents: MC NEIL & MOODY, *Stationers, 23 Moorgate Street, Bank.*—Wrought-iron fire-resisting safes, chests, and doors; cabinet, rim, and mortise locks.

Author of a "Treatise on Fire and Thief proof Depositories and Locks and Keys," and a "Treatise on Gunpowder-proof Locks, Drill-proof Safes," &c.



MERCHANTS' OR BANKERS' BOOK AND CASH SAFE.

No. 1. MERCHANTS' OR BANKERS' BOOK AND CASH SAFE, with 3-in. fire-proof composition chambers, and fitted with 38 compartments for books, formed by 32 movable partitions; 4 drawers for day use for coin, notes, and bills of exchange, with 3 distinct safes at the bottom, made of ½-in. boiler plates with case-hardened drill-proof doors, for the additional safety of cash and securities at night. All the doors are fitted with George Price's double patent "ne plus ultra" unpickable and gunpowder-proof lock, each lock different, with a master key to pass all. Size, outside measure, (exclusive of plinth and cornice) 8 ft. 6 in. high, by 6 ft. wide, by 2 ft. 6 in. deep . . £300 0

No. 2. SINGLE-DOOR PRECIOUS STONE OR CASH SAFE, made of ¾-in. solid boiler plates, with 1-in. solid door. The whole body and door case-hardened. With 2 drawers. Size, 33 by 25 by 25 in. £40 0

No. 3. SINGLE-DOOR SAFE with 2 drawers and case-hardened drill-proof door. The lock chamber of this is unscrewed to show the construction of the locks. Size, 26 by 20 by 20 in. Quality, 201 C . £14 2 6

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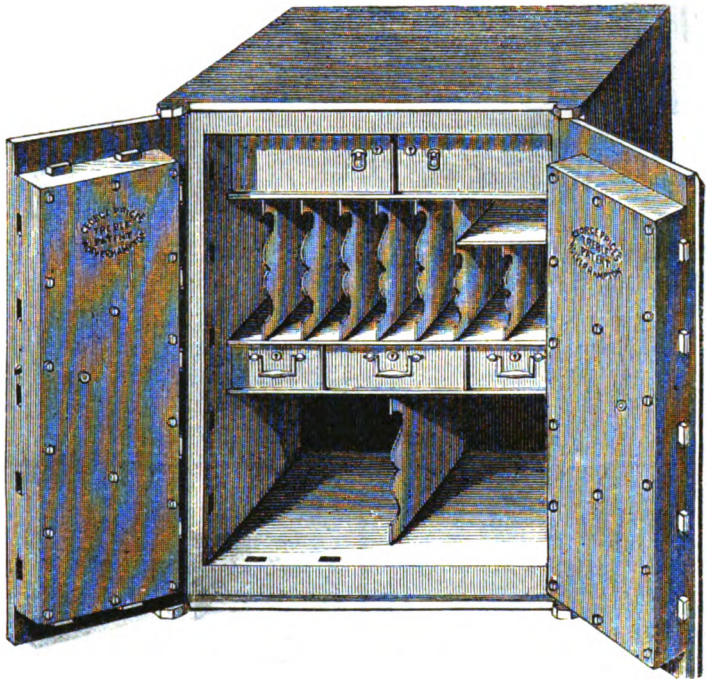
PRICE, GEORGE, *continued.*

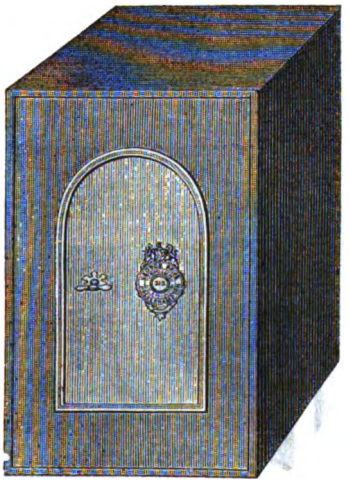
No. 4. WATCHMAKERS' AND JEWELLERS' SAFE. Not fire-proof. Made of ½-in. boiler plates with case-hardened drill-proof door, and fitted with one shelf. Size, 48 by 30 by 26 in. £39 7 6
This safe represents the strength and quality of the patentee's foreign bankers' bullion rooms.

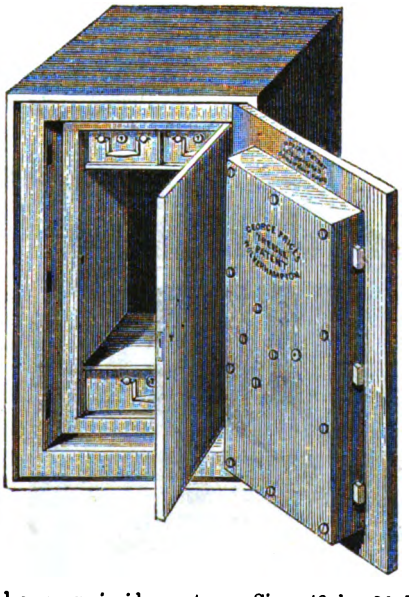
No. 5. SINGLE-DOOR BOOK OR CASH SAFE, with 2 drawers. Size, 33 by 25 by 25 in. Quality, 201 C £18 0

No. 6. DOUBLE-DOOR BOOK OR CASH SAFE, with 2 drawers. Size, 30 by 30 by 24 in. Quality, 202 C £22 0



No. 7. MERCHANTS' COUNTING-HOUSE SAFE, with 3-in. fire-proof composition chambers, and fitted with 3 drawers, cupboards, and compartments for books and papers. The partitions are movable. The locks on the drawers and cupboards are all different, with a master key to pass. Size, 66 by 52 by 30 in. Quality, 202 D £80 0





No. 8. BANKERS' SAFE, with 5-in. fire-proof composition chambers, and fitted with 3 drawers and an inner door, secured by a mortise spring lock. The outer door is rendered drill-proof by being case-hardened, and is hung on inside centres. Size, 48 by 30 by 30 in. Quality, 206 D £50 0
The left-hand cut shows the style of the safe when the door is closed, and also represents the Burnley safe, No. 2.

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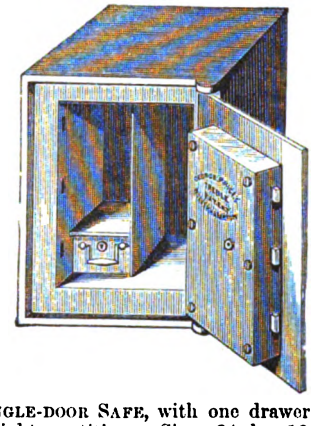
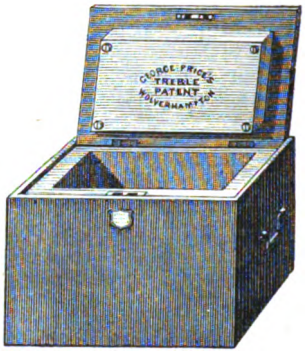
PRICE, GEORGE, *continued.*

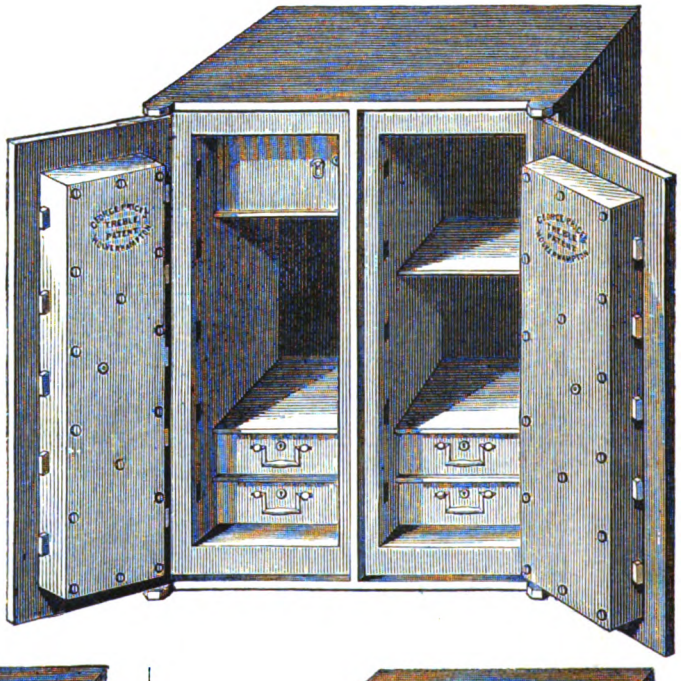


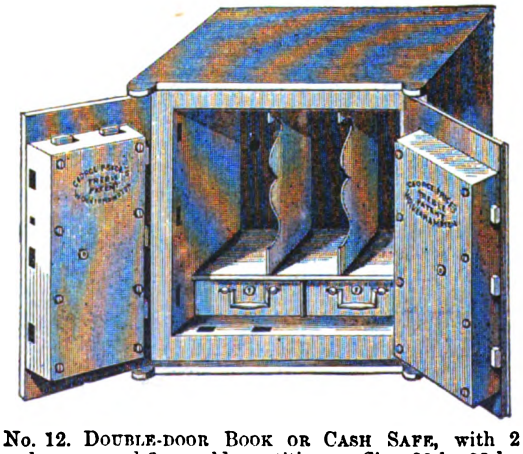
No. 9. SINGLE-DOOR SAFE, with one drawer half across and upright partition. Size, 24 by 18 by 18 in. Quality, 201 B £9 0



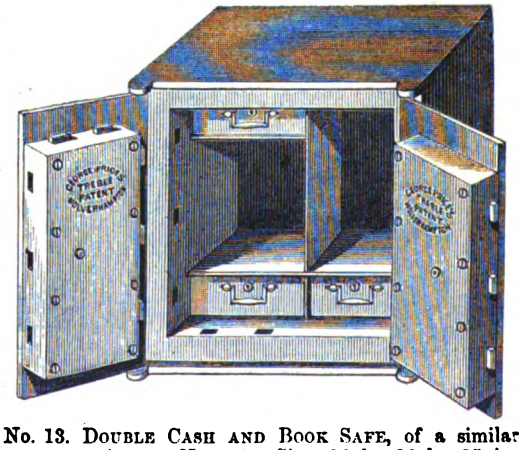
No. 10. FIRE-PROOF DEED CHEST. Size, 18 by 13 by 13 in. Quality, No. 120 . . . . . £5 0

No. 11. DOUBLE CASH AND BOOK SAFE, each compartment being in itself distinct and equally secure. Size, 63 by 48 by 30 in. Quality, 204 D, with case-hardened doors. Price £100 0





No. 12. DOUBLE-DOOR BOOK OR CASH SAFE, with 2 drawers, and 2 movable partitions. Size, 33 by 33 by 25 in. Quality, 202 B £24 0



No. 13. DOUBLE CASH AND BOOK SAFE, of a similar construction to No. 11. Size, 36 by 36 by 25 in. Quality, 202 C £32 10

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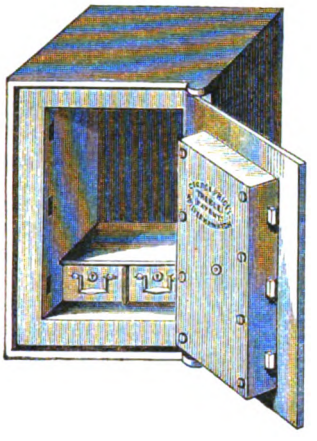
PRICE, GEORGE, *continued.*

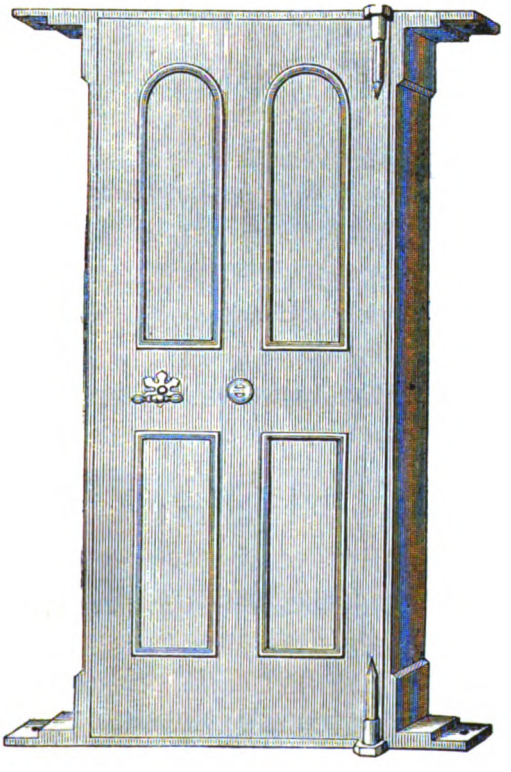


No. 14. SINGLE-DOOR SAFE with 2 drawers. Size, 28 by 22 by 22 in. Quality, 201 B £12 0

No. 15. SINGLE-DOOR SAFE with 2 drawers. Size, 28 by 22 by 22 in. Quality, 201 C £14 0

No. 16. SINGLE-DOOR SAFE with 2 drawers. Size, 24 by 17 by 15 in. Quality, the People's safe . . . £7 0

No. 17. DOUBLE-DOOR BOOK SAFE with 2 drawers. Size, 30 by 30 by 24 in. Quality, 202 B £20 0

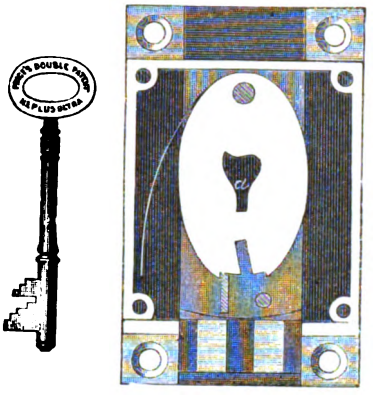


No. 18. FIRE-PROOF DOOR AND FRAME. Size, 6 ft. by 2 ft. 6 in. Quality, 130 C £20 0

No. 19. DOOR AND FRAME NOT FIRE-PROOF, opens inwards. Size 6 ft. by 2 ft. 6 in. Quality, 130 C £20 0

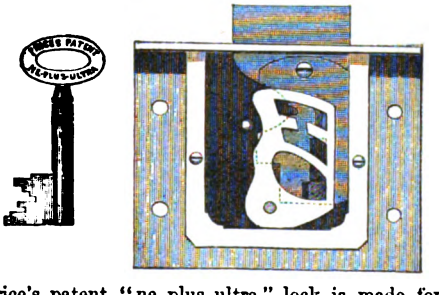
No. 20. FIRE-PROOF DOOR AND FRAME. Size, 6 ft. 6 in. by 3 ft. Quality, 130 D £32 0

No. 21. FIRE-PROOF DOOR AND FRAME. Size, 6 ft. 6 in. by 3 ft. Quality, 130 D, with sunk panels . £40 0



Nos. 33 to 40. PRICE'S DOUBLE PATENT "NE PLUS ULTRA" UNPICKABLE AND GUNPOWDER-PROOF LOCK, with small hardened pin keys. *a* shows the open space in which the key works, being the only cavity into which gunpowder can be forced through the keyhole. The white part represents the levers or tumblers.

Nos. 35 and 36. The same, after being tested by repeated explosions of gunpowder.



Price's patent "ne plus ultra" lock is made for all purposes and of every size.

Nos. 45 and upwards, represent specimens of the following kinds :—

Till or drawer, 1 to 4 in. from 9*s.*
Straight cupboard, 1 to 4 in. from 9*s.*
Cut cupboard, 1 to 4 in. from 9*s.*
Box, chest, and sloping desk ; mortise camp desk ; pedestal or sideboard ; link plate cupboard ; travelling desk ; and mortise box, 1 to 4 in. from 10*s.*
Cash box with fixed nosle, 2½ to 4 in. from 10*s.* 6*d.*
Pad, 1 to 5 in. from 10*s.*
Silver pad, ½ in. 30*s.*
Portfolio and writing case, 10*s.*
Trunk and portmanteau, 3 to 4½ in. from 14*s.*
Book-edge or ledger lock, from 16*s.*
Letter bag, 12*s.*
Round escutcheon lock, for locking up the keyholes of other locks, 20 .
Flush night latch, 3½ to 6 in. from 14*s.* 6*d.*
Drawback rim night latch, 4 to 6 in. from 16*s.*
Mortise night latch, from 3 to 4½ in. from 23*s.*
Rim dead to lock on one side only, 4 to 12 in. from 16*s.*
Rim dead to lock on both sides, 4 to 12 in. from 19*s.*
Spring lock for front doors, 6 to 10 in. from 28*s.*
Mortise 1-bolt dead, 3 to 7 in. from 20*s.*
Mortise 2-bolt, 5 in. 33*s.*; 6 in. 35*s.*; 7 in. 38*s.*
Mortise 3-bolt, 6 in. 37*s.*; 7 in. 40*s.*
Mortise hall-door lock, 5 in. 30*s.*; 6 in. 32*s.*; 7 in. 35*s.*

The above prices include two hardened keys to each lock.
Ornamental key handles, 40 specimens.
Price's patent door spindle.
Large specimen lock (24 in. dead) to show the principle of construction.
Japanned cash and deed boxes.

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[6198]

RITCHIE, JAMES, 22 *South B. of Canongate, Edinburgh.*—Improved composite metallic cord for counter weights, cords of gaseliers, hanging pictures, and sash line.

[6199]

RITCHIE, WATSON, & Co., *Etna Foundry, Glasgow.*—Kitcheners, cabooses, grates, mantel-pieces, gill air warmers, plumbers' goods. (*See page* 79.)

[6200]

ROBERTS, WILLIAM, *Lion Foundry, Northampton.*—Register stoves, kitchen ranges, ornamental cast-iron tables, chairs, &c.

[6201]

ROBERTSON & CARR, *Chantry Works, Sheffield.*—Register grates, hot air stoves, fenders and fire irons. (*See page* 80.)

[6202]

ROBOTHAM, SAMUEL, *Bradford Street, Birmingham.*—Patent woven wire fencing, guards, cages, wire, and general wire work.

[6203]

ROCKE, WILLIAM, *Phœnix Foundry, Wolverhampton.*—Samples of machinery from refined pig-iron; ditto refined wrought-iron.

[6204]

ROGERS, PETER, & Co., 106 *Digbeth, Birmingham.*—Steelyards, scale beams, scales, weighing machines, stocks, and dies.

[6205]

ROLLASON, ABEL, & SONS, *Bromford Mills, Erdington, near Birmingham.*—Patent steel music-wire and metals.

[6206]

ROWLEY, CHARLES, & Co., 23 *Newhall Street, Birmingham;* 49 *Aldermanbury, London; and* 1 *High Street, Manchester.*—Buttons, ornaments, bill files, and fancy goods. (*See page* 81.)

[6207]

ROWLEY, S. A., 63 *Clement Street, Birmingham.*—Pearl buttons and studs.

[6208]

RYFFEL, I. E., *Wimbledon.*—Hygeian stove, the most effective, economical, healthy, cleanly and safe stove ever invented.

[6209]

ST. PANCRAS IRON WORK COMPANY, THE, *Old St. Pancras Road, London, N.W.*—Interior of stable, and ornamental gates.

[6210]

SCOTT, J. W., *Sidbury Works, Worcester.*—Patent solid leather buttons; patent valve leather gun wads; patent leather washers, &c. (*See page* 82.)

[6211]

SHERWIN, JOSEPH, *Tabernacle Walk, Finsbury.*—Economic kitchen range for baking, boiling, steaming, roasting, and improved supply.

[6212]

SMITH, FREDERICK, & Co., *Halifax.*—Bar-iron, and wire in various stages to finest sizes.

[6213]

SMITH, THOMAS, 27 *St. John's Square, Wolverhampton, and* 18 *St. Mary Axe, London.*—Hardware and cutlery.

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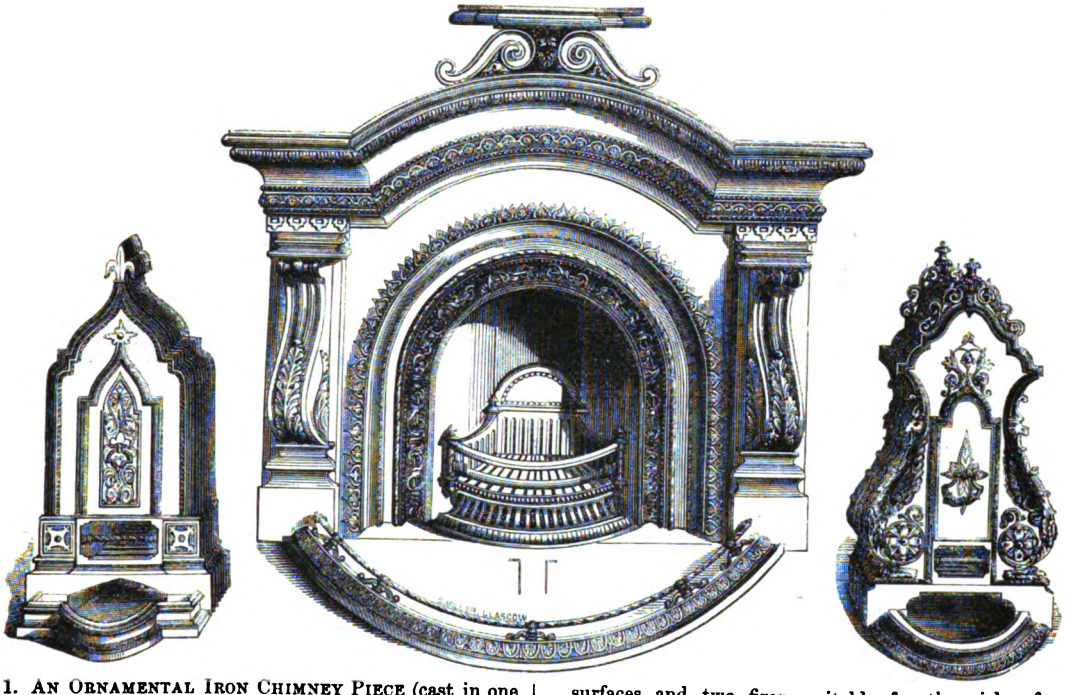
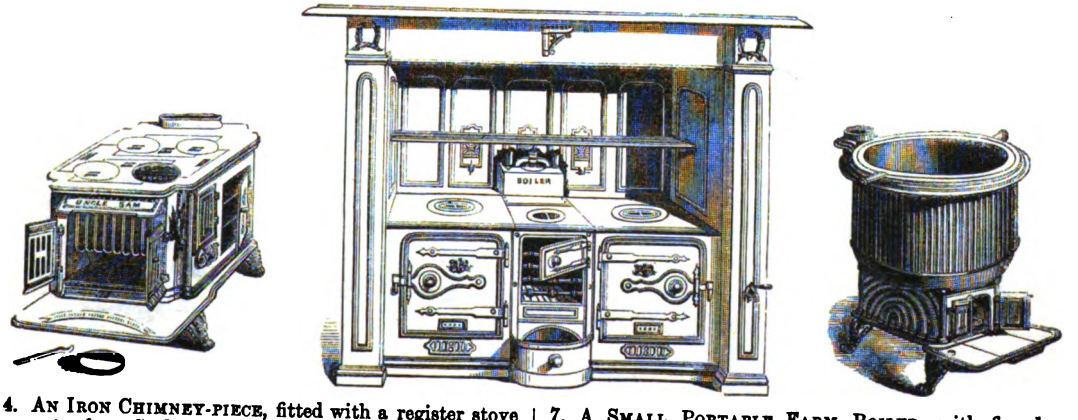
RITCHIE, WATSON, & Co., *Etna Foundry, Glasgow.*—Kitcheners, cabooses, grates, mantel-pieces, gill air warmers, plumbers' goods.

RITCHIE, WATSON, & Co. are ironfounders and sole manufacturers of the patent Etnean kitcheners, open-fire kitchen ranges, stove grates, gill air warmers, hot air and gas stoves, hot-water apparatus, rain-water goods, patent mangles, patent stable fittings, &c.



1. AN ORNAMENTAL IRON CHIMNEY PIECE (cast in one piece), with a circular opening and arched slab. The slab surmounted by an ornamental stand for clock, bust, or vase. The chimney piece is fitted with an ornamental register stove grate, with fire-clay linings, radio-protectio ashes pan, circular fender, steel fire-irons, &c. Style, Italian.
2. AN ORNAMENTAL GILL AIR WARMER, with radiating surfaces and two fires, suitable for the aisle of a church. This stove is also made with one fire. The same pattern may be had with four different sizes of gills. Style, Gothic.
3. AN ORNAMENTAL GILL AIR WARMER, suitable for a large room, hall, or lobby, made also with two fires. Style, Renaissance.



4. AN IRON CHIMNEY-PIECE, fitted with a register stove grate, &c. Style, mediæval.
5. AN ORNAMENTAL BALUSTRADE.
6. AN ETNEAN KITCHENER, with two roasters, a wrought-iron welded boiler, iron chimney piece, plate rack, &c. These kitcheners are made any size, from 3 ft. to 30 ft. and with any desirable number of roasters, brick or iron ovens, boilers, steam closets, close or open fire, &c. the manufacturers having had fully 40 years' experience in this department of manufacture.
7. A SMALL PORTABLE FARM BOILER, with fire-clay linings, made in five sizes.
8. AN ECONOMIC COOKING STOVE, on the American principle — Uncle Sam by name — made in three different sizes, and with or without boilers, hot-water apparatus, &c.
9. A miscellaneous assortment of RAIN-WATER GOODS, PUMPS, PATENT STABLE FITTINGS, HOT-WATER APPARATUS, and other goods suitable for ironmongers, plumbers, builders, &c.

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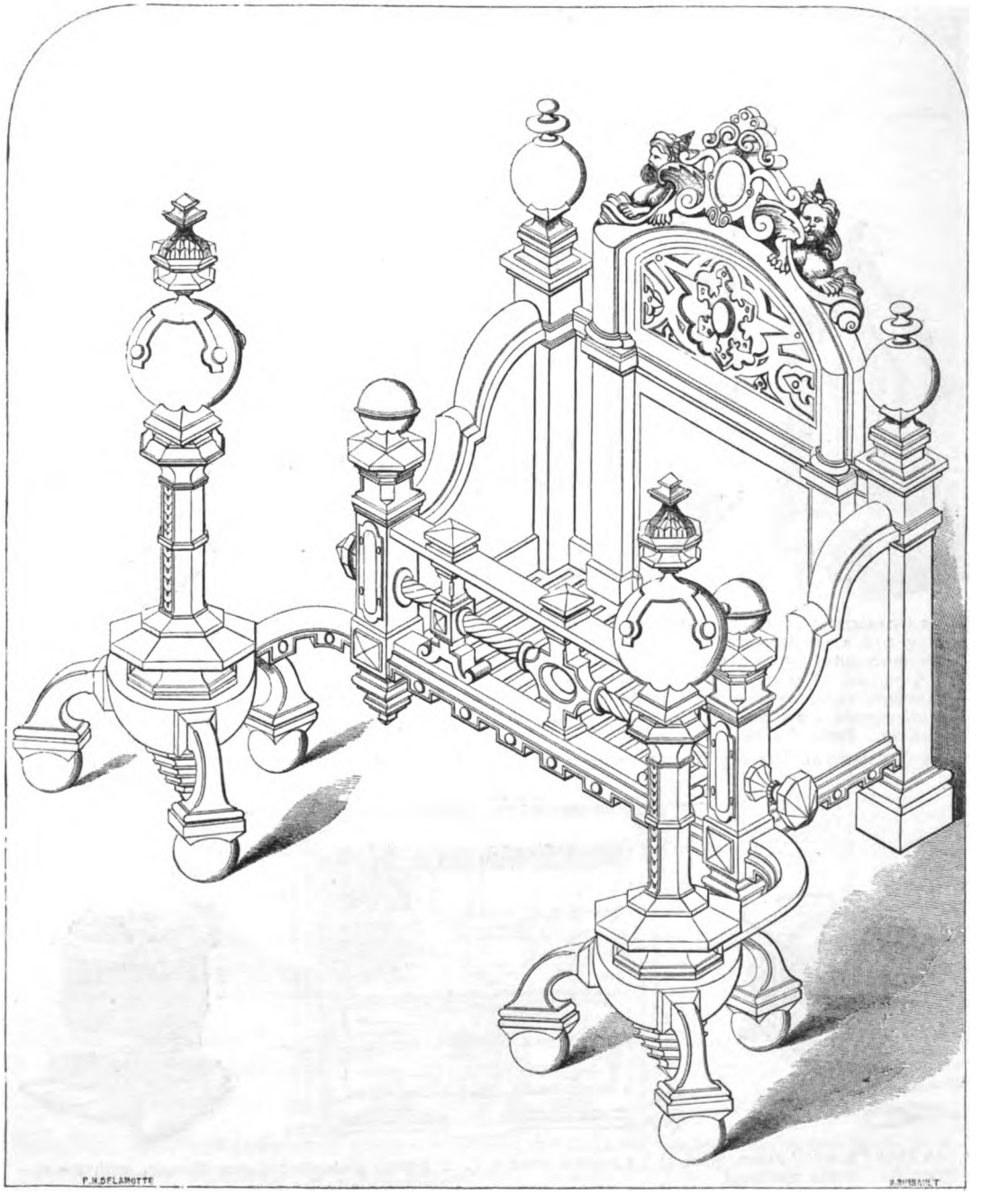
ROBERTSON & CARR, *Chantrey Works, Sheffield.*—Register grates, hot-air stoves, fenders and fire irons.



A PILLAR GRATE IN THE TUDOR STYLE.

A PILLAR GRATE in the Tudor style, adapted for a baronial mansion. The body, bars, and dogs are cast-iron. The balls and jewelled ornamentation are malleable iron, being susceptible of a high polish, contrasting with the deep black of the body of grate.

Size, extreme width, 4 ft. 1 in.; ditto depth, 2ft. 3 in. but can be made in other sizes.

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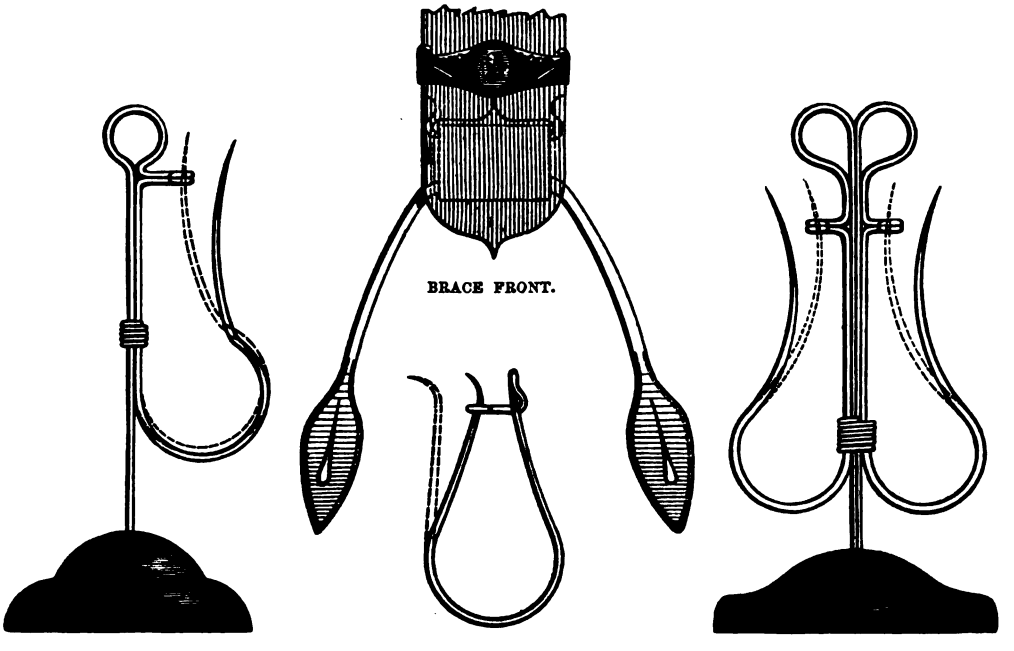
ROWLEY, CHARLES, & Co., 23 *Newhall Street, Birmingham;* 49 *Aldermanbury, London; and* 1 *High Street, Manchester.*—Buttons, ornaments, pins, bill files, and fancy goods.

CHARLES ROWLEY & Co. are general button manufacturers, stampers, piercers, tool makers, and patentees of the safety pins, so admirably adapted for children's under-clothing, ladies' shawls, &c. Stay, and other eyelets, military ornaments, belt, garter and other clasps; and the sole manufacturers of the Albert self-adjusting brace slide, protected by patent and registration.

This adjuster for gentlemen's braces, will be found the most simple, efficient, and economic adjuster ever offered to the public.

Open. Shut.

PATENT PINS.



BRACE FRONT.

TICKET HOLDER OR BILL FILE. BILL FILE.

C. R. & Co. are also patentees and sole manufacturers of the universal mercantile and domestic bill file, which being made of stout or fine wire, admits of being adapted for a variety of useful purposes; the point in every instance being held and protected, the articles filed will be secured, and yet present every facility for removal or examination, and are also adapted for suspending prints, drawings, and other like articles. These useful appendages to the office, retail shop, or private house, may be made for suspension, or fitted with a stand as here illustrated. To be had retail at all respectable stationers, ironmongers, and dealers in small wares. They are, likewise, general manufacturers of brace and other buckles, naval, military, crest, and other buttons, brass and iron ship thimbles, weavers' mails, and a variety of other such-like small articles.

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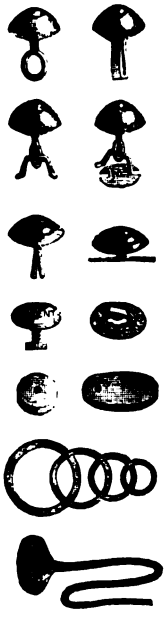
SCOTT, J. W., *Sidbury Works, Worcester.*—Patent solid leather buttons; patent valve leather gun wads; patent leather washers, &c.



The exhibitor is patentee of the following:—

The PATENT SOLID LEATHER BUTTONS are manufactured with leather shanks, also metal, cord, gut, &c. and in designs suitable for boots, gaiters, upholstery, dresses, and vests; they are finished in bronzes and enamelled colours, and inlaid work.

The REGISTERED STUD-SHANK PATENT LEATHER BUTTON is a ready and efficacious method of attaching buttons to boots for ornamental purposes, without sewing, instantaneous in application, and appear riveted on.

The PATENT HINGE-JOINTED BUTTON AND FASTENER, used on Dent, Allcroft, Lycett, & Co.'s patent cut gloves, exclusively as a glove button, and as the best and surest fastener extant for knickerbocker rifle gaiter buttons.

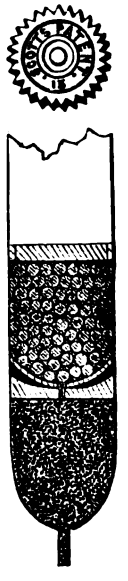
SOLID LEATHER NUTS AND BUTTONS for pianoforte and organ purposes.

PATENT CUT LEATHER WASHERS in any substance of calf or buff leather, cut to sixteenths diameter, from ¼ in. centres to 2 in. (or larger to order).

PATENT CUT LEATHER LACES, with flat heads.

SCOTT'S NEW PATENT EXPANDING VALVE, and compressed leather concave compound gun wads.

These patent wads are a scientific novelty of very peculiar construction. The compound which secures the effects hereinafter set forth, consists of a concave cup compressed in solid butt leather at certain angles, and also of a resilient valve made of leather. This inner cup or valve exactly fits the wad just described, and is riveted or firmly attached thereto at the centre only, leaving the sides free, but somewhat larger, so that it shall rest in the barrel rather in excess of the bore.



Whilst the wad is being rammed down upon the powder, the valve sufficiently collapses to allow it to pass easily down the barrel; but on its discharge, the reverse action takes place—the projecting edge of the expanding valve becomes pressed against the circumference of the barrel—effectually rendering it perfectly air-tight, and thus secures to the explosive gases the retention and resistance necessary for perfect combustion, and development of their propelling powers. Power is in proportion to the resistance.

Special agent in London, Mr. T. Seaber, colonial merchant, 21 and 22 Falcon Square, E.C.

[6214]

SMITH, THOMAS & WILLIAM, *Royal Exchange Buildings, London, and Newcastle-upon-Tyne.*—Wire and hemp ropes.

[6215]

SMITH & WELLSTOOD, *Columbian Stove Works, Bonnybridge, Glasgow.*—Kitchen cooking portable stoves, ranges, heating stoves, portable farmers' boilers. (*See page* 83.)

[6216]

SPOKES, JOSEPH, *North Street Mews, Fitzroy Square.*—Wood meat-screens and refrigerators.

[6217]

STANDING, THOMAS, *Preston, Lancashire.*—Galvanized wire netting, fencing staples, patent size, colour, and liquid agitator. (*See page* 83.)

[6218]

STANDLEY, WILLIAM, 38 *Park Street, Walsall.*—Bits, spurs, stirrups, bridles, reins, bombilloes, lasso rings, cruppers, and cavesons.

[6219]

STANLEY, JOHN M., & Co., *Midland Works, Sheffield.*—Gill air warmers, kitchen ranges, cooking apparatus, and stove grates.

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SMITH & WELLSTOOD, *Columbian Stove Works, Bonnybridge, Glasgow.*—Kitchen cooking portable stoves, ranges, heating stoves, portable farmers' boilers.

No. 1. FAMILY OR KITCHEN STOVE, with hot-water attachment. All sizes and styles of these portable kitchen cooking stoves are made, ranging in price from

£3 3*s.* upwards.

HALL STOVE.

No. 2. PORTABLE LAUNDRY OR FARMERS' BOILER, made in 5 sizes, holding from 15 to 60 gallons, can be conveniently used in any position, and they are made to run on wheels or not as may be desirable. Prices from

£2 15*s.* upwards.

The exhibitors are manufacturers of American stoves and ranges.

STANDING, THOMAS, *Preston, Lancashire.*—Galvanized wire netting, fencing staples, patent size, colour, and liquid agitator.

STANDING'S PATENT SUN AND PLANET MOTION AGITATOR, and models of cisterns for mixing liquids, size, colours, starch, &c. for cotton-manufacturing, calico-printing, dyeing, and brewing purposes.

This apparatus is now in use in numerous large and well-known establishments; and is acknowledged to be the most efficient and complete invention for preparing size, colours, liquids, &c. yet extant; whilst the thorough agitating motion is not equalled by anything in the United Kingdom.

These machines can be made to any given size. Estimates on application. References to a large number of English firms using them.

The sun and planet motion consists of dashers, revolving round a fixed wheel, and at the same time turning upon their own axis in different directions. By this arrangement, the greatest possible agitation is produced, and from the very bottom to the top of the vessel the whole of the liquid is agitated to a complete foam.

FOR COLOURS AND STARCH.

A strong copper pan, with wrought-iron steam-jacket, fitted up with three dashers, revolving upon their own axes as well as round the vessel at the same time. Steam is introduced into the cavity between the iron jacket and copper pan, by which the liquid in the pan is kept boiling continually whilst the agitation is going on. These pans can be made to any size, but the sizes usually made are 100, 150, and 200 gallons.

FOR SIZE-PREPARING.

A strong cistern, fitted up with several sets of agitators, all turned from one cross shaft. These are made in sizes adapted for mixing at one time 10, 15, 20, or 30 sacks of flour, with the necessary quantity of water. In the cistern the flour and water is agitated so as to form a fine liquid; an improved pump is attached by which the liquid is raised to a copper boiling pan with iron steam-jacket. In this pan the liquid is boiled and agitated at the same time, from which it is conveyed by a pump adapted for the purpose, to the dressing or sizing frames.

FOR BREWING.

The patent apparatus is fitted up to large vats. The peculiar motion causes every particle of the compound to be disturbed, the whole being equally agitated from top to bottom.

STANDING'S MACHINE-MADE GALVANIZED WIRE NETTING AND FENCING, for protecting young plantations, shrubberies, pleasure grounds, parks, gardens, wheat, barley, and general crops, against hares and rabbits; for sheep-fencings, and for flower, fruit, and vine-training, &c.

BLACK AND GALVANIZED STRAINED WIRE FENCING.

GALVANIZED WIRE STRAND FENCING.

BLACK AND GALVANIZED SELF-BORING STAPLES, made by machinery, for railways, telegraph companies, &c. for fixing fencing wire and strand fencing. Made all sizes suitable for any purpose.

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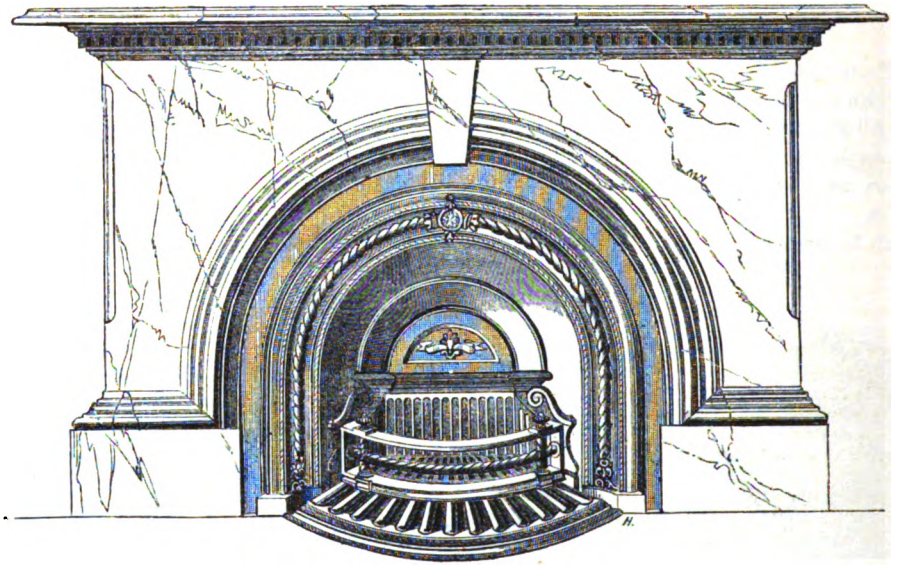
[6220]

STARK, JOHN C., 13 *Strand, and Swan Street, Torquay.*—Grates and kitchen ranges.



The exhibitor is a wholesale ironmonger, and manufacturer of marble chimney pieces, stoves, kitchen ranges, and all kinds of iron work.

He executes marble chimney pieces to any design, and to architects' own drawings.

Specimens of Devonshire marbles can be had on application, also see Class I. Eastern Annex.

[6221]

STEEL & GARLAND, *Wharncliffe Works, Sheffield.*—Stoves, grates, and fenders.

[6222]

STEPHENSON, JAMES, & Co., *Mill Wall Telegraph Works, Poplar, E.*—Wire rope for ships' standing rigging.

[6223]

STUART & SMITH, *Roscoe Place, Sheffield.*—Stoves, grates, fenders, fire irons, and castings.

[6224]

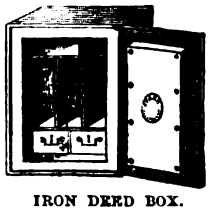
STUBBS, WILLIAM HENRY, *Park Crescent, London, N.W.*—Instruments for cleaning forks.

[6225]

TALBOT, C. & S., *Marylebone Iron Works, Great Titchfield Street.*—Cooking apparatus and utensils.

[6226]

TANN, JOHN, 30 *Walbrook, E.C.*—Patent reliance and other locks, fire-proof safes, iron doors, cash and deed boxes.

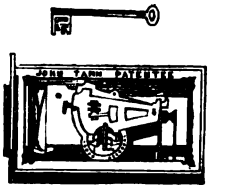


IRON DEED BOX.

Manufacturers to Her Majesty's Government. Established 1795.

JOHN TANN'S PATENT RELIANCE LOCKS AND FIREPROOF SAFES are the best and cheapest safeguard against fire and robbery.
John Tann's fireproof iron door for strong rooms and party walls.
John Tann's fireproof room and bullion chests.
John Tann's cash and deed boxes.
John Tann's patent Reliance cylinder locks.
John Tann's improved lever locks, street-door latches.

Patent Reliance Lock and Safe Warehouse, 30 Walbrook, London.



PATENT LOCK.

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[6227]

TAYLOR, JOHN, JUN., Architect, 53 *Parliament Street.*—Smoke consuming and ventilating grates, apparatus, &c.

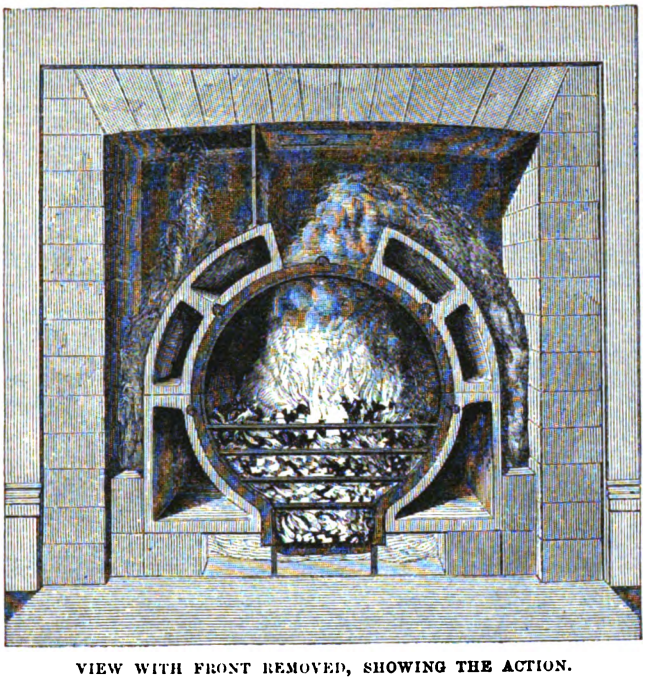
The Inventor during his professional practice as an architect has had his attention particularly directed to some of the drawbacks to the Englishman's enjoyment of his fireside. These may be enumerated under the four following heads :

1. Smoke, undeprived of its carbon, or soot (which is fuel), contaminates the atmosphere, disfigures and decays buildings, and an incalculable amount of annoyance arises from smoke and smoky chimneys. Mechanical contrivances to effect the combustion of smoke will be ineffective when left, as they must often be, to the care of ordinary domestic servants.

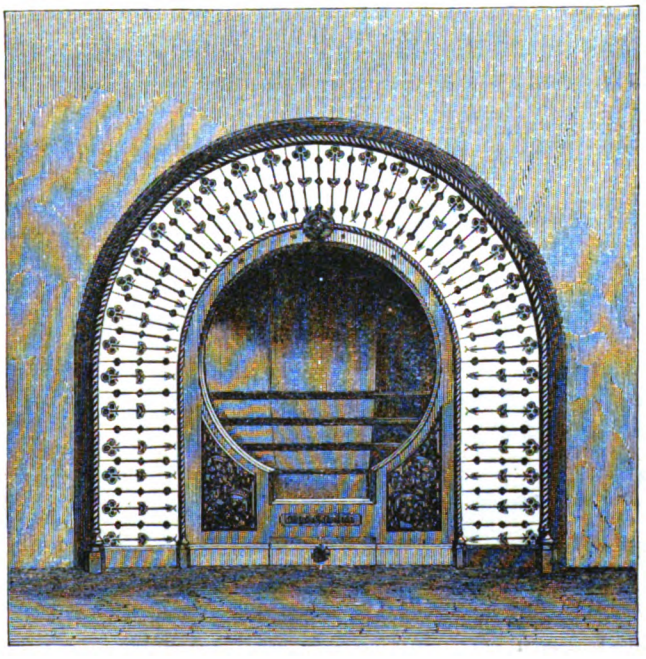
2. The annual loss in London alone of the 75 per cent. of heat (an acknowledged fact), which escapes up the chimney without adding to the warmth of the apartment. The calculation of this does not afford any consolation in his discomfort.

3. The air necessary to support combustion makes its way to the fire from door or window, chink or crevice, and visits his back with hurtful draughts in proportion to the warmth he is receiving in front.

4. A frequent cause of smoky chimneys is that the chimney becomes filled with the air from the apartment, which, rushing in above the fire, lowers the temperature, and renders the flue incapable of acting as a sufficiently rarefied ventilating shaft, and often incapable of even conveying away the smoke at all.



VIEW WITH FRONT REMOVED, SHOWING THE ACTION.



FRONT VIEW OF THE SMOKE CONSUMING AND VENTILATING GRATE.

The peculiar features in these grates, which have been invented to cure the above evils, are :—

1. When the register is closed, the smoke, having ascended from the fuel and become mixed with atmospheric air, descends, and passes through the hottest part of the fire, where the carbon, or soot, in the smoke, is consumed as fuel.

2. The heat which would have rushed up the chimney, calculated at 75 per cent. passes down and around the hollow fire lumps of which the grate is formed, and the external air with which these communicate enters the apartment in a large body, moderately warmed, not heated.

3. The apartment is supplied with moderately warmed, instead of cold air, from door or window, and thus thorough ventilation is effected.

4. The cold air cannot rush up the chimney : the flue is, therefore, rendered a powerful extracting shaft for ventilation, and a highly rarefied, and consequently effictual, passage for the products of combustion, thus obviating another fruitful source of smoky chimneys.

Should the warmth be too great, the register can be opened, and the action of an ordinary grate will take place.

In addition to these advantages, the fire is always under perfect control, and may at all times be brought to any degree of brightness.

Its combustion of fuel is so perfect that what remains in the ash-drawer after the day's consumption, if proper attention has been paid, might be taken away in the palm of the hand.

The occupation of the sweep will be nearly dispensed with.

These grates are manufactured in designs suitable for every class or style of building, at prices ranging from 3 to 50 guineas.

Further information may be obtained by applying at the Offices, 53 Parliament Street, where also all orders are received.

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[6228]

TAYLOR, WILLIAM, 11 *Sheepcote Street, Birmingham.*—Improved shutter bars, door springs, bell springs, and kneeling frame.

[6229]

THOMAS, W. H., 6 *Sloane Street.*—Fire screen for dining-room; door porters.

[6230]

TITFORD, R., VANDOME, & Co., 117 *Leadenhall Street, E.C.*—Scales, weighing machines, weights, &c.

[6231]

TONKS, SAMUEL, *Great Hampton Street, Birmingham.*—Galvanized iron and japanned goods.

[6232]

TOOVEY, EDWARD & CHARLES, *Wolverhampton.*—Ironmongery and general hardware, for home, foreign, and colonial markets.

Messrs. TOOVEY are exporters of hardwares, including locks, bolts, and all other fittings used in buildings and furniture; brass foundry of every kind, wrought and cast iron goods, edge and other tools for the use of carpenters and others, cutlery of every variety, steel toys, japanned and tin wares, including tea-trays, &c. iron coffee and other mills, and kitchen utensils of every description.

Catalogues of all articles of ironmongery manufactured at Wolverhampton suitable for continental, foreign, or colonial markets, will be forwarded upon application.

[6233]

TUCKER & REEVES, 181 *Fleet Street, London, E.C.*—Locks, tin boxes, and fire-proof safes.

[6234]

TURNER, G., 13 *Rose Terrace, Fulham Road, Brompton.*—Machinery and articles for domestic use.

[6235]

TYLOR & PACE, 5 *Queen Street, Cheapside, London.*—Metallic bedsteads, window blinds, and perforated metals.

[6236]

UPFILL, THOMAS, & SONS, *Birmingham.*—Metallic bedsteads, carriage axletrees, van arms, wrought-iron hurdles, and fencing.

[6237]

VINCENT, ROBERT, *St. George's Place, Camberwell.*—Improved smoke-resisting stove door.

[6238]

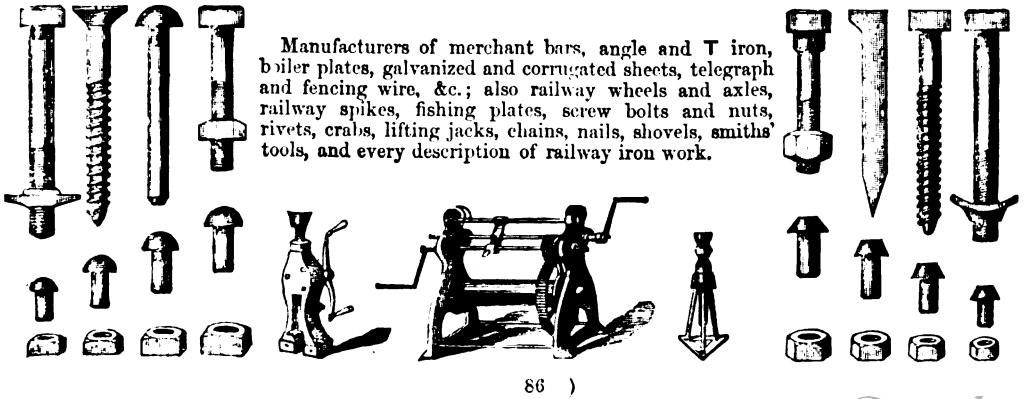
WALKER & CLARK, 6 *Cardington Street, N. W.*—Wire cloths and wire work for manufacturing and ornamental purposes.

[6239]

WALKER, THOMAS, & SON, *Oxford Street, Birmingham.*—Stoves for warming buildings.

[6241]

WARDEN, JOSEPH, & SONS, *Railway Iron Works, Edgbaston Street, Birmingham.*—Railway screw bolts, nuts, and railway appliances.



Manufacturers of merchant bars, angle and T iron, boiler plates, galvanized and corrugated sheets, telegraph and fencing wire, &c.; also railway wheels and axles, railway spikes, fishing plates, screw bolts and nuts, rivets, crabs, lifting jacks, chains, nails, shovels, smiths' tools, and every description of railway iron work.

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[6242]

WATKIN, WILLIAM, & Co., *High Street, Stourbridge.*—Spades, shovels, anvils, and vices.

[6243]

WATKINS & KEENE, *London Works, Birmingham.*—Bolts, nuts, couplings, tie rods, &c.

[6244]

WEBSTER & HORSFALL, *Birmingham.*—Patent steel music rope, and other wires.

[6245]

WELDON, C. & J., *Cheapside, London, and Loveday Street, Birmingham.*—Covered and other buttons.

[6246]

WENHAM LAKE ICE COMPANY, THE, 140 *Strand.*—Refrigerators, ice-cream machines, freezing powders, patent soda-water machines.

REFRIGERATORS, unequalled for preserving ice and provisions, and cooling wine, water, butter, cream, jellies, &c.
Machines for making and moulding ices, carafe freezers, improved freezing powders, and everything connected with freezing of the best, cheapest, most durable and reliable character. Patent soda water and bottling machines.

[6247]

WEST, HARRIET, 344 *Euston Road.*—Ornamental iron and wire works.

[6248]

WHALEY, BURROWS, & FENTON, *Queen's Ferry Wire and Wire Rope Works, near Flint.*—Burrows' patent conical winding drums; patent horizontal incline drums; wire rope, and telegraph cables. (*See page* 88.)

[6249]

WHITE, THOMAS, *Thorpe Hesley, near Rotheram.*—Improved screw bolts and nails, machine forged files, steel pruning hooks, gas hooks.

[6250]

WHITFIELD, SAMUEL, & SONS, *Birmingham.*—Iron bedsteads, japanned and gilt; wrought-iron fire and thief proof safes.

Obtained a Prize Medal for safes at the Exhibition of 1851.

[6251]

WHITFIELD, THOMAS, & Co., *Birmingham.*—Frying pans, wrought hollow ware and general iron-plate goods.

[6252]

WHITLEY, JOHN, *Ashton, near Warrington.*—Cathedral hinge and handles, and other wrought-iron hinges.

[6253]

WILDS, WILLIAM, *Hertford, Herts.*—A ceiling ventilator (patent); model of stove for domestic warming invented by the exhibitor.

[6254]

WILKINS & WEATHERLY, 39 *Wapping, London.*—Specimens of rope made of steel, iron, and copper wire.

[6255]

WILLS BROTHERS, *Metropolitan Drinking Fountain Depôt,* 12 *Euston Road.*—Art drinking fountains in bronzed iron.

[6256]

WINCHESTER, GRAVELEY, & SAGER, 40 *to* 42 *Upper East Smithfield.*—Patent sea water distilling and cooking apparatus.

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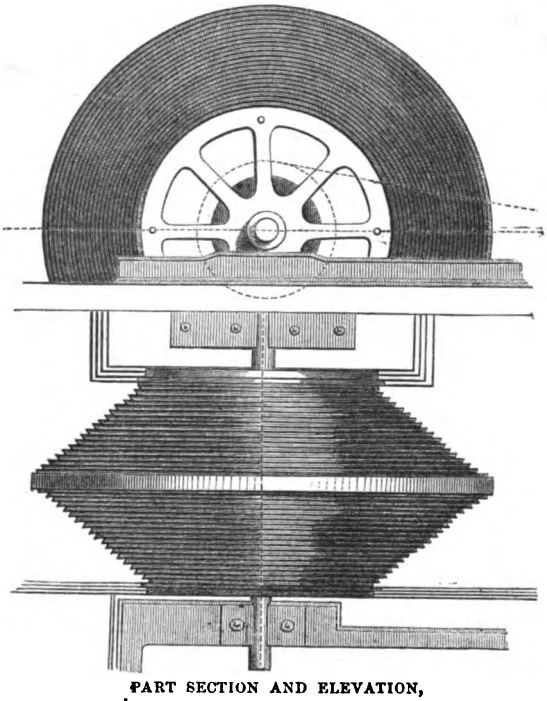
WHALEY, BURROWS, & FENTON, *Queen's Ferry Wire and Wire Rope Works, near Flint.*—Burrows' patent conical winding drums; patent horizontal incline drums; wire, rope, and telegraph cables.



PART SECTION AND ELEVATION,
BURROWS' PATENT COMPENSATING WINDING DRUM.

Specimens of PATENT WIRE ROPE, for collieries, mines, inclined planes, ships' standing rigging; copper rope for lightning conductors, wire cables for submarine and other telegraphs, wire strands for fencing, railway signal lines.

Wire Rope applied to winding purposes by means of Burrows' PATENT COMPENSATING WINDING DRUM.

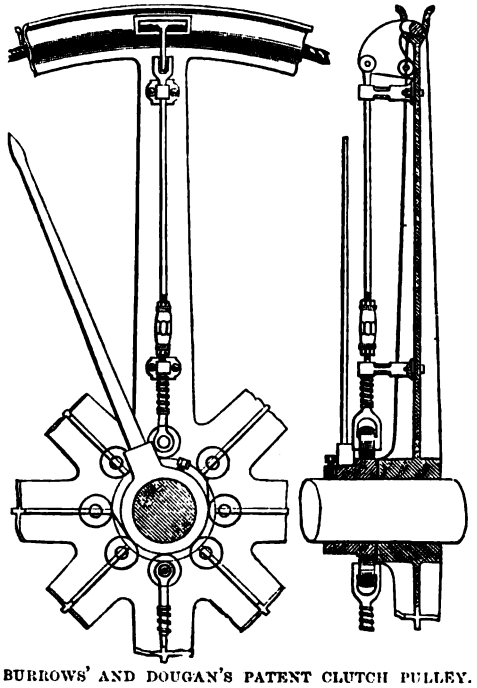
The drum admits of the ropes and cages being balanced at all points in the pit; therefore, when the pit is of such a depth that the weight of one rope is equal to the weight of coals to be lifted at one time, an engine of half the usual power, or steam at half the usual pressure, will suffice, or a greater load of coals may be raised.

When starting the load from the bottom, it is raised without the violent concussion which is experienced with the usual form of drum.

It has been found in practice that it is scarcely possible to overwind with this drum.

The ropes last much longer on this drum.

STUBBS AND FENTON'S TELL-TALE.



BURROWS' AND DOUGAN'S PATENT CLUTCH PULLEY.

Wire Ropes in connexion with Burrows' and Dougan's "CLUTCH DRUM," and Stubbs' and Fenton's "TELL-TALE."

The use of the clutch pulley facilitates the substitution of wire ropes in place of chains for working inclines, &c. Half a turn round the pulley is sufficient for holding, as all slip is prevented by the grippers, and wear and tear consequently reduced to a minimum.

By means of these pulleys and ropes, power may be easily transmitted to almost any distance, and in any direction with the greatest facility.

The use of the "tell-tale" diminishes the strain upon and consequently the wear and tear of the ropes. The weight of the load is registered and rendered evident at a glance. It is simple, cheap, and strong.

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[6257]

WINFIELD, ROBERT WALTER, & SON, *Birmingham, and* 141 *Fleet Street, London.*—Tubes, bedsteads, gas fittings, brass foundry, &c. (*See pages* 90 *to* 93.)

[6258]

WINTER, HENRY, 3 *Paragon Road, Hackney.*—Patent lifting and weighing machine, greatly economising labour and expense.

[6259]

WITHERS, GEORGE, & SONS, *Park Works, West Bromwich.*—Patent fire-proof and thief-resisting safes and money chests.

[6260]

WOOD, BROTHERS, *Stourbridge.*—Chain cables, anchors, anvils, vices, &c.

[6261]

WOODIN, DENNIS, 2 *Upper Park Place, Dorset Square.*—Horse shoes which prevent slipping on stones or ice.

PATENT HORSE SHOES.

WOODIN'S PATENT HORSE SHOES, for preventing horses slipping on stone pavements or ice or other surfaces, have now stood the test of years, and are pronounced by competent judges to be the best ever offered to the public. They give a strong firm hold, and a level tread, prevent cutting or "clacking," are one-third lighter than the common shoe, and at the same time equally durable, and are put on at the same price.

WOODIN'S ELASTIC PREPARED PADDING prevents and cures contraction, corns, sandcracks, thrushes, and concussion of the joints. It gives an equal bearing to all parts of the feet, and keeps them always moist and cool. Price 6*s.* 12*s.* and £1 4*s.* per case.

WOODIN'S GOLDEN STIMULATING ABSORBING OINTMENT, supersedes the firing-iron for the cure of spavins, ring-bones, curbs, splints, and enlargements of the joints, &c. It reduces them in a surprisingly short time without leaving any blemish, and frequently without interfering with work. It is sold only by the exhibitor. Prices, from 5*s.* upwards, according to size of pot. Proper directions for its application are forwarded with every pot.

[6262]

WRIGHT, GEORGE, & Co., *Burton Weir, Sheffield.*—Stoves, grates, fenders, kitcheners, umbrella stands, chairs, tables, &c.

[6263]

WRIGHT, PETER, *Constitution Hill Works, Dudley.*—Patent vices and anvils of various descriptions, cramps, &c.

[6264]

WRIGHT & NORTH, *Monmore and Cleveland Iron and Steel Works, Wolverhampton.*—Specimens of iron and steel, and Stocker's patent combined metal tyre-bars.

The following are exhibited :—

Specimens of boiler plate.
Ditto cast-steel ditto.
Ditto sheet iron.
Ditto galvanized iron.
Ditto corrugated iron.
Ditto hoop iron.
Ditto bar iron.
Ditto spring steel.
Ditto boiler rivets, stamped.

Specimens of ditto rolled, under Arrowsmith's patent. Sole manufacturers.

Specimens of combined metal for wheel tyres and horse shoes, rolled, under Stocker's patent. Sole manufacturers.

Specimens of horse shoes made from the patent combined metal bars. Trade mark, "Mon-moor."

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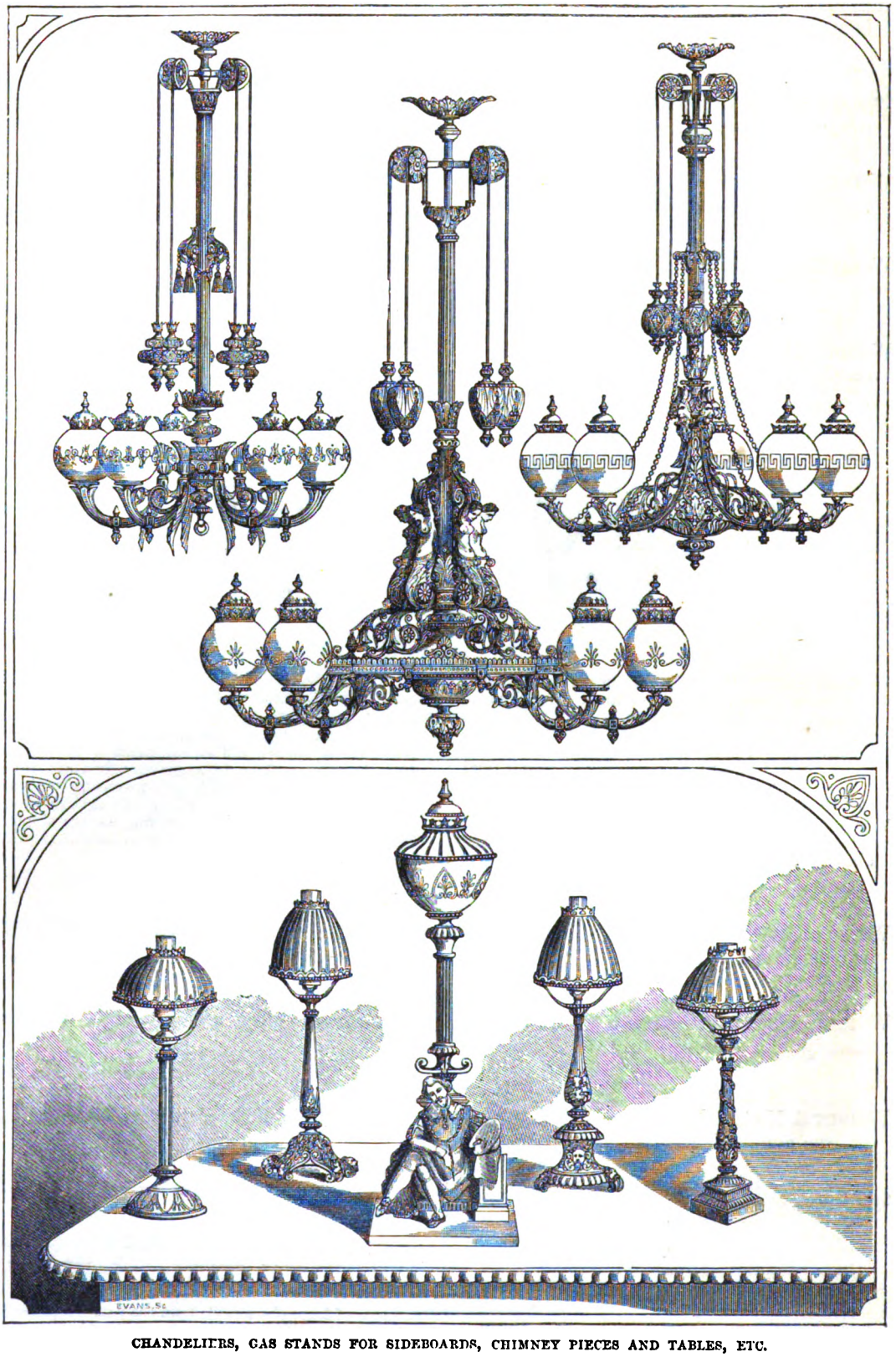
WINFIELD, ROBERT WALTER, & SON, *Birmingham, and* **141** *Fleet Street, London.*—Gas fittings, bedsteads, brass foundry, tubes, &c.



CHANDELIERS, GAS STANDS FOR SIDEBOARDS, CHIMNEY PIECES AND TABLES, ETC.

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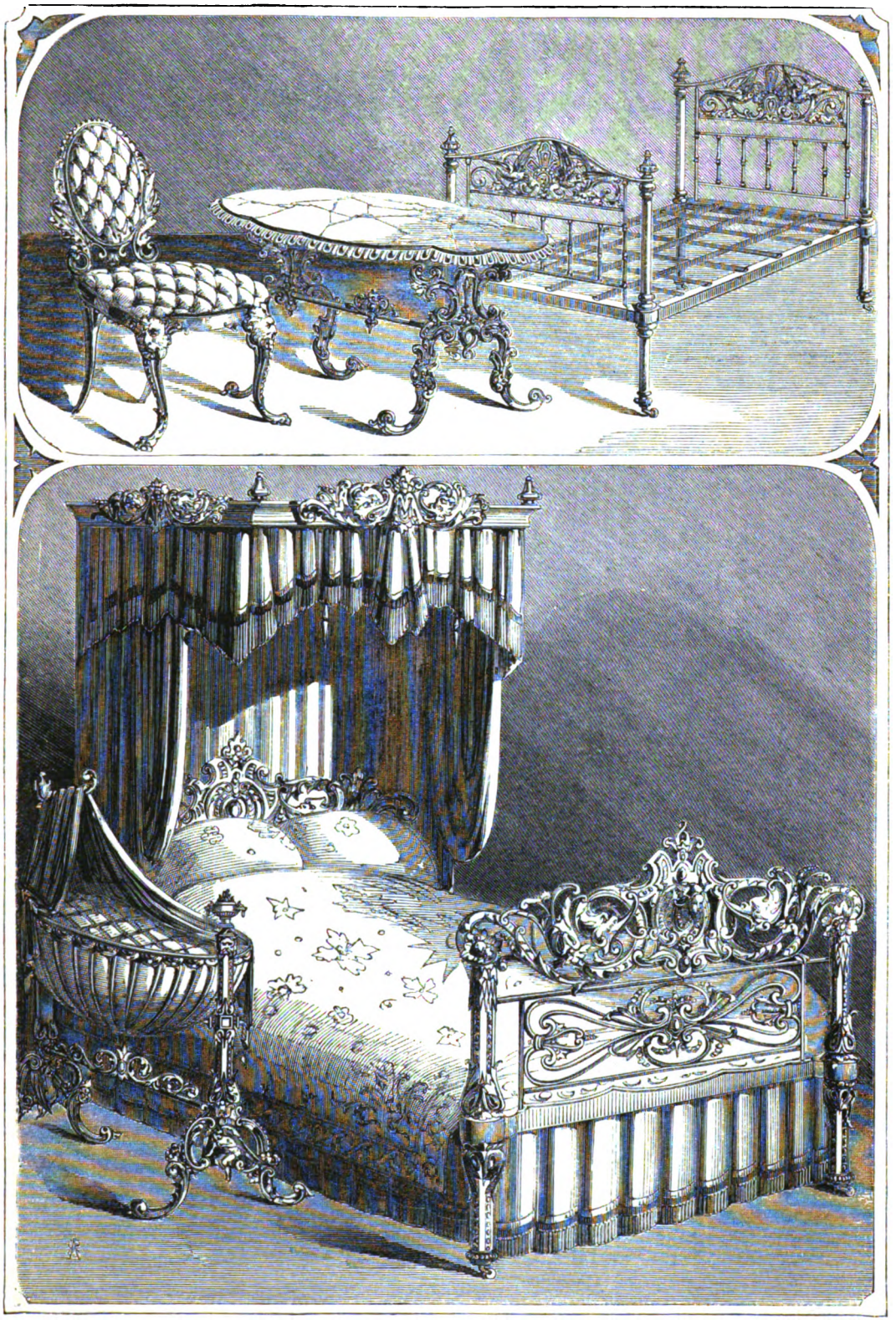
WINFIELD, ROBERT WALTER, & SON, *continued.*



BRASS ARABIAN AND FRENCH BEDSTEADS, SWINING COT, CHAIR AND TABLE, ETC.

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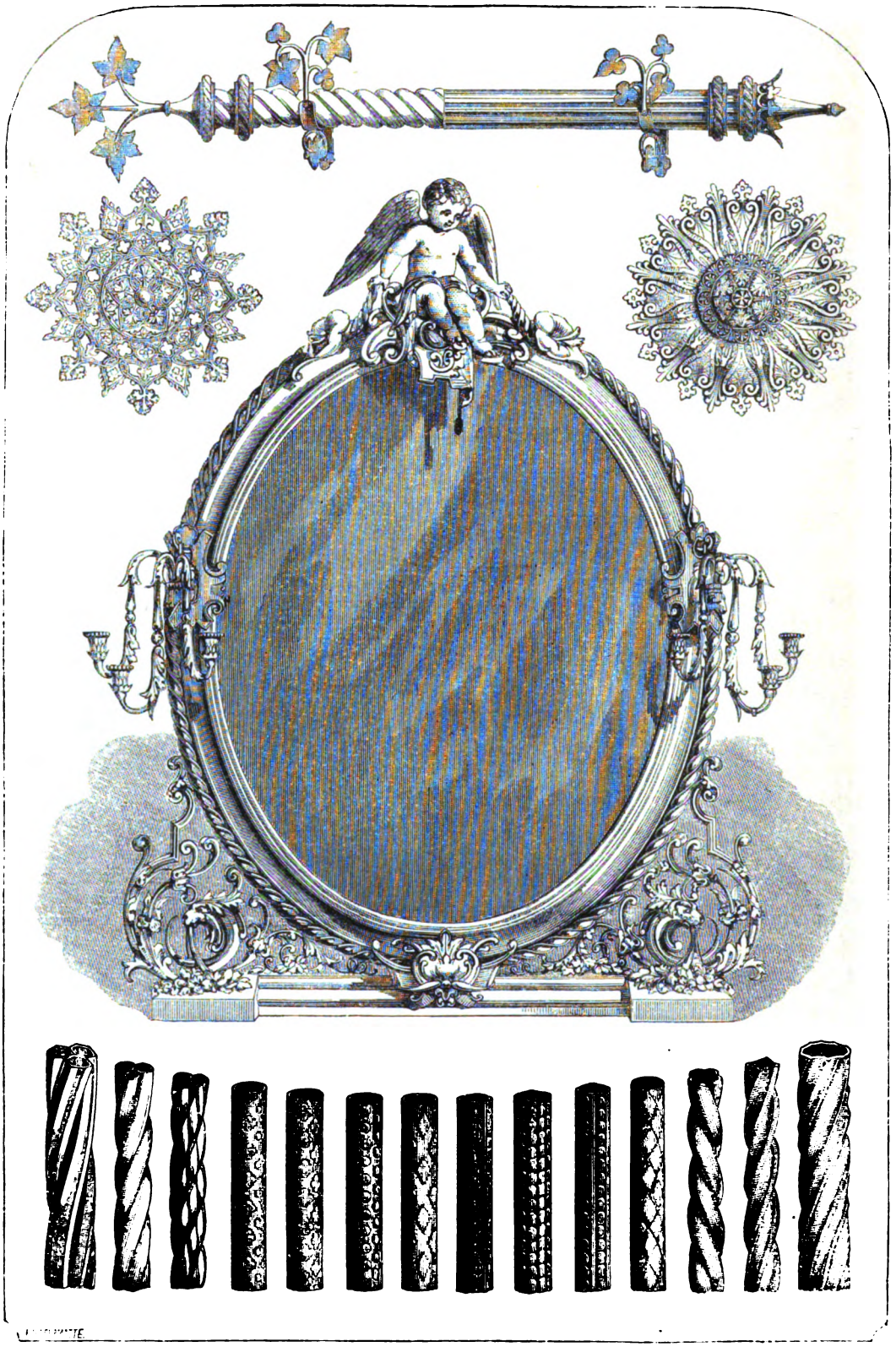
WINFIELD, ROBERT WALTER, & SON, *continued.*



CORNICE POLE, CEILING ROSES, METAL FRAME LOOKING GLASS, TUBES.

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WINFIELD, ROBERT WALTER, & SON, *continued.*

DRAWING-ROOM CHANDELIER FOR GAS, in silver bronze and relief, outline formed from ornamental panelled angular tubes, Hunt's patent.

DRAWING-ROOM CHANDELIER FOR GAS, in bright gold, fitted with an internal sliding apparatus, Hunt's patent.

CHANDELIER FOR GAS, in bronze frame-work, formed of angular tubes, filled in with rich ornamental panels, and fitted with an internal sliding apparatus, Hunt's patent.

CHANDELIERS FOR GAS. (See illustrations.)

GAS STANDS, in bright gold and bronze, for sideboards and chimney pieces, also fitted with flexible tube, as portable lights for tables, &c.

SMOKE-ABSORBING GAS SHADES, Hunt's patent.

GAS BURNERS of various kinds.

IMPROVED PATENT BRASS FOUR-POST BEDSTEAD, with massive pillars, mountings, "hop foliage" cornice, and head and foot rails to correspond; circular dovetail joints, china bowl castors. (No. 3661.)

IMPROVED PATENT BRASS FOUR-POST BEDSTEAD, with pavilion tester, tapered pillars, made of the patent embossed metal, mountings and ornaments in arabesque style. (No. 3687.)

IMPROVED PATENT BRASS TENT BEDSTEAD, with ornamental mountings and head and foot rails. (No. 3572.)

HALF-TESTER, OR ARABIAN BEDSTEAD, of brass, with pillars of patent tubing, wrought mountings, and elaborate cast ornaments on the head and foot rails. (No. 3644.) See illustration.

HALF-TESTER, OR ARABIAN BEDSTEAD, with plain pillars, the vases and mountings in imitation of precious metals and stones. (No. 3633.)

Others, with the head portions of iron, with mountings of ruby (No. 3761) and opal (No. 3749).

FRENCH BEDSTEADS, in brass, one with panelled head and foot rails, and parallel twisted pillar (No. 3779); another with ornamental head and foot rails (blackberry and poppy), and mountings on plain pillars, (No. 3775); a third with ornamental head and foot rails (birds and oakleaves), the vases and mountings to the pillars in imitation of precious metal and precious stone (No. 3776). See illustration.

BRASS BEDSTEAD, for travellers or military officers. (No. 3055.)

SWINGING COTS, with ornamental stands (No. 3499). See illustration.

CHILDREN'S CRIBS, several examples, some with patent brass pillars.

CENTRE TABLE, with marble top (No. 3713). See illustration.

RECUMBENT CHAIRS, frames of ornamental tubing. (Nos. 3006—8.)

ELEGANT DRAWING-ROOM CHAIR, in brass, richly chased, with white satin seat. (No. 3019.) See illustration.

REGISTERED FIRE GUARDS, OR DRESS PROTECTORS, in brass. (No. 3723—24.)

REGISTERED FIRE GUARDS, OR DRESS PROTECTORS, in iron. (No. 3718—19.)

IRON BEDSTEADS, of various shapes, japanned in the ordinary manner, and likewise by the patent processes of ornamenting—viz. the pattern produced in various colours at one operation, and the combination of gold and colours.

FOLDING CHAIR BEDSTEAD, with patent double-action head piece, forming when necessary a bed rest for an invalid. (No. 3731.)

PORTABLE CHAIR, for overland or sea journeys. (No. 3014.)

N.B.—Short side rails are inserted in some instances to allow of the exhibition of a greater number of patterns, the bedsteads being in all cases made of the ordinary length. The stability of these bedsteads is guaranteed, the continuous tube pillar, patented 22d December, 1831, is used in combination with circular dovetail joints; white china bowl castors are generally applied to best bedsteads, many of the designs are registered under the copyright Act, 5 & 6 Vic. cap. 100.

LARGE OVAL GLASS, brass frame, composite ornament, with figure and candle branches, &c. (See illustration.)

Stamped window cornices, cornice poles of various kinds, stamped brass foundry, ceiling roses enamelled white and other colours, mantel-piece banner arms, screen poles, balustrades, drapers' brackets and shop-window fittings, sash bars, name plates, bed rings, stair rods, and weights of every ornamental character.

Examples of the following articles, for the use of brass founders, engineers, &c. Brass tubes for locomotives brazed joints, brass and copper tubes plain and ornamental, including twisted, reeded, fluted, and others, indented by a patent process. (See illustration.) Iron tubes coated with brass, parallel, twisted, reeded, or taper; tin and zinc tube, brass wire for pin makers and wire workers; copper wire for electric telegraph cables, plain, or coated with brass or tin, African rods in copper or brass, brass and copper piston rods, sheet brass of all sizes and gauges, spelter solder, common stair rods, beadings, and clips, &c.

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[6265]

YATES, HAYWOOD, & DRABBLE, *Rotherham and London.*—Stoves, fenders, and other ornamental furniture in cast-iron.

Register stoves, warm air stoves, fenders, cooking ranges, fire-irons, tables, hat and umbrella stands, gates, fencing, balusters, and various other similar goods in cast-iron, steel, and ormolu, shown as specimens of the ordinary manufactures of the house.

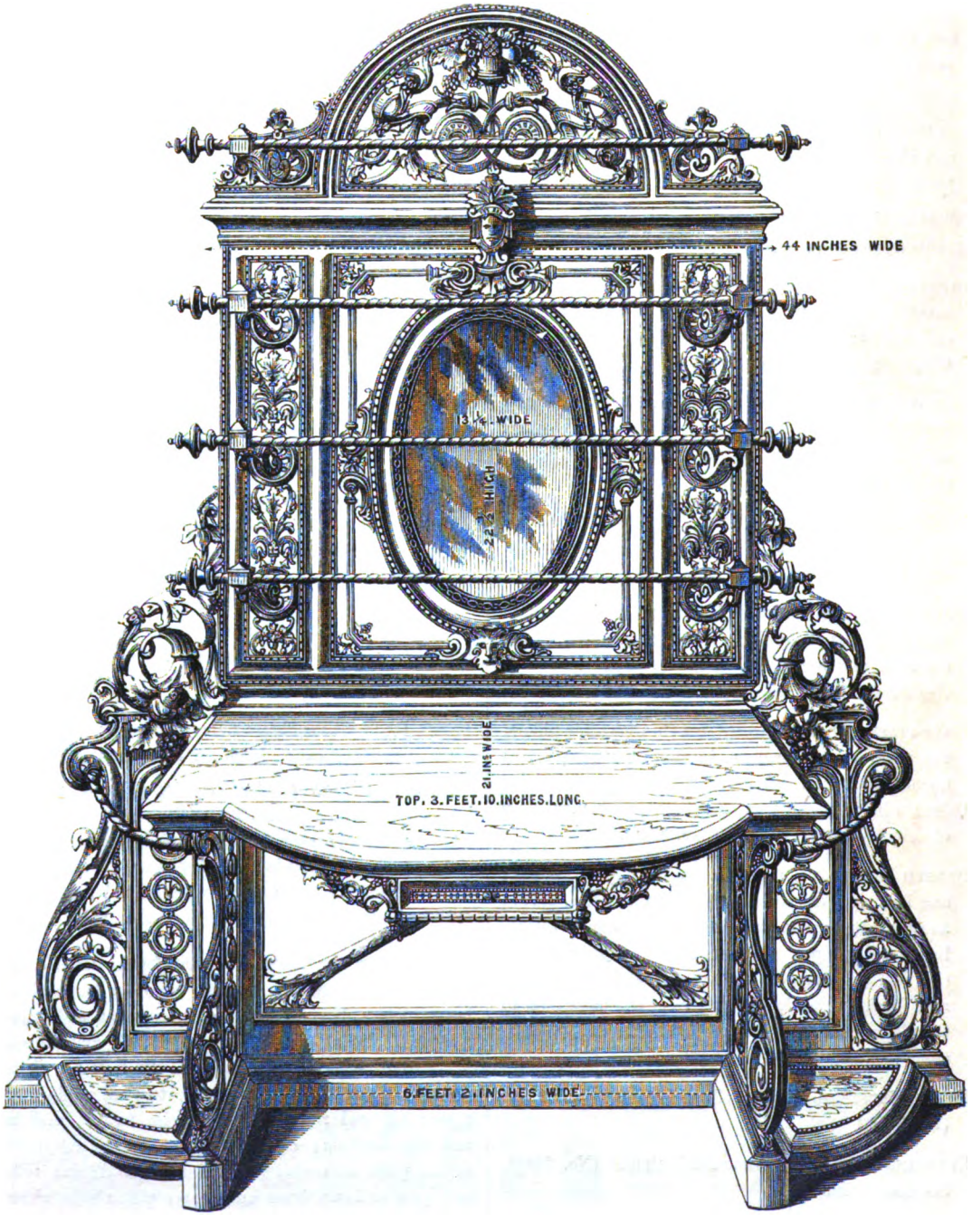

TABLE AND STAND FOR HATS AND UMBRELLAS

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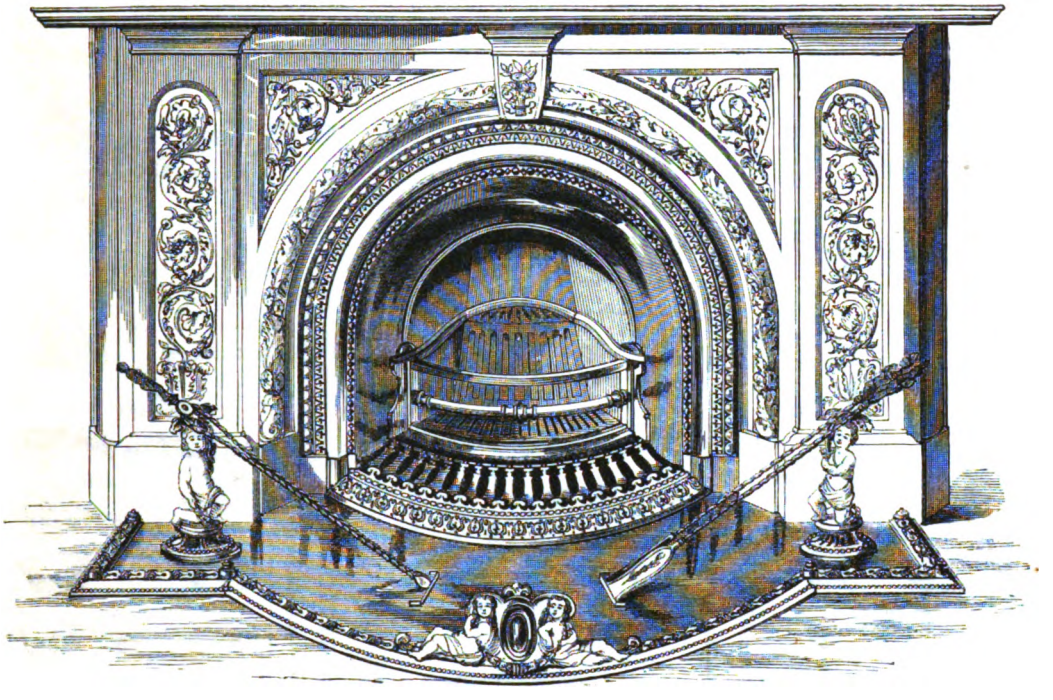
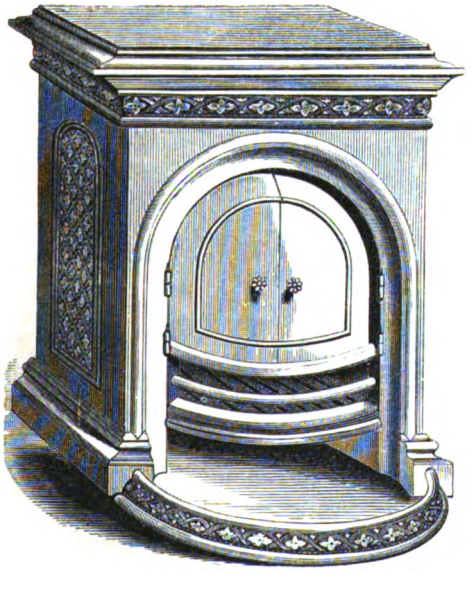
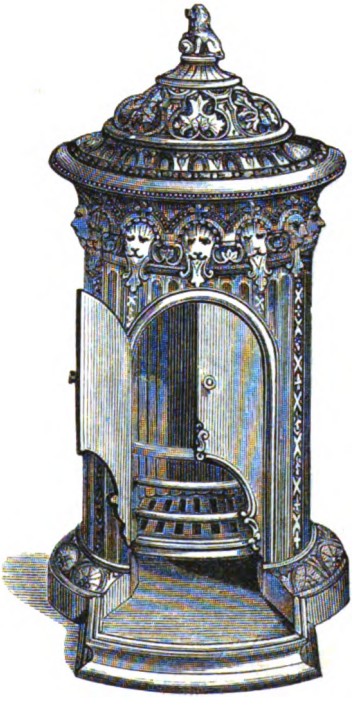
YATES, HAYWOOD, & DRABBLE, *continued.*



STATUARY MARBLE CHIMNEY PIECE AND STEEL GRATE, with ormolu enrichments.



WARM AIR STOVE, bright, with electro-bronzed ornaments, selected from a very copious stock of designs fit for general use.



CIRCULAR WARM AIR STOVE electro-bronzed.

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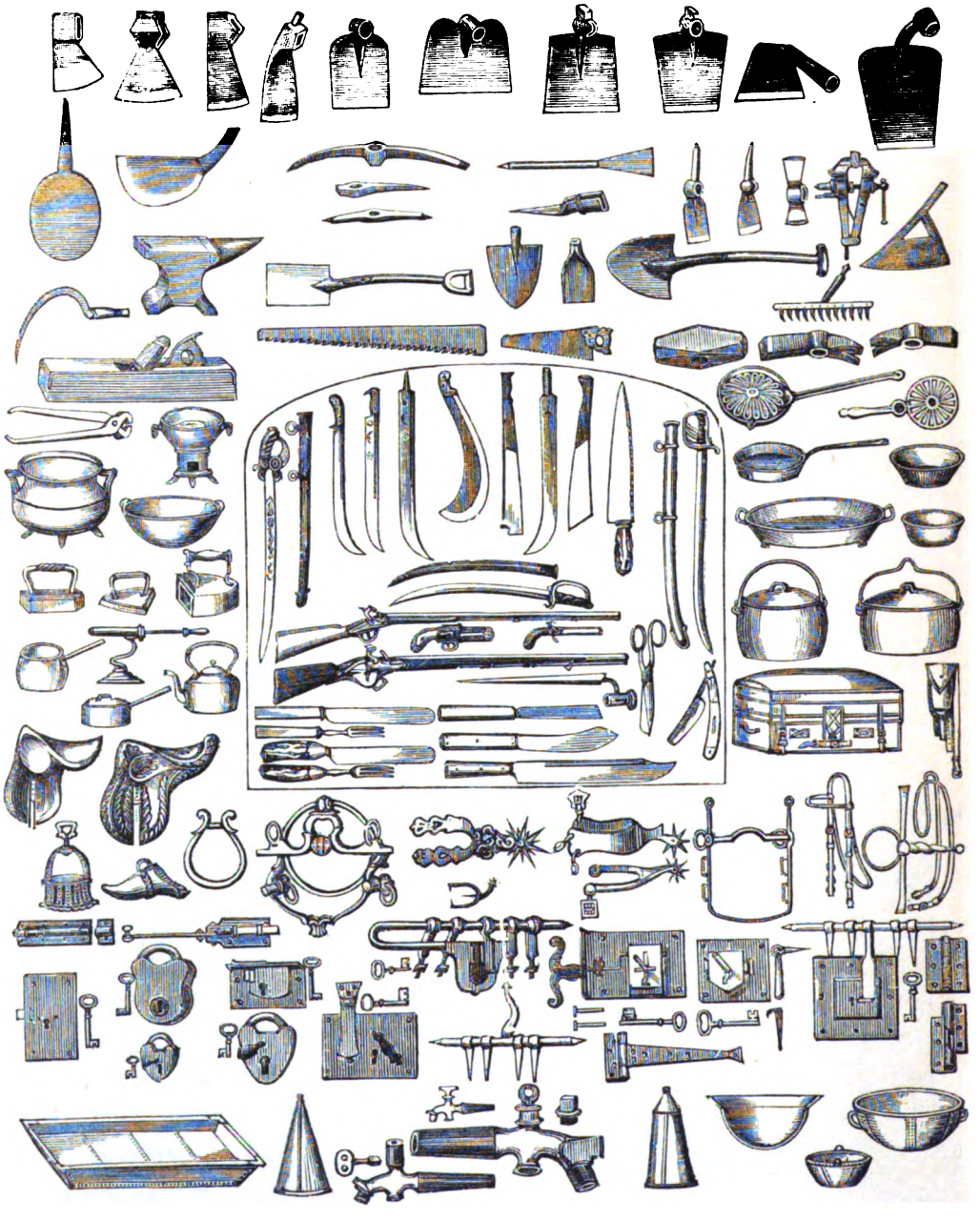
YORK, SAMUEL, & CO., *Wolverhampton.*—Hardware goods made at Wolverhampton, suitable for every foreign market.



SPECIMENS OF A FEW ARTICLES OF HARDWARE, being the production of Wolverhampton and its adjacent districts, and such as are supplied for shipment to foreign markets. London agent, Wm. Roberts, 50 Little Britain.

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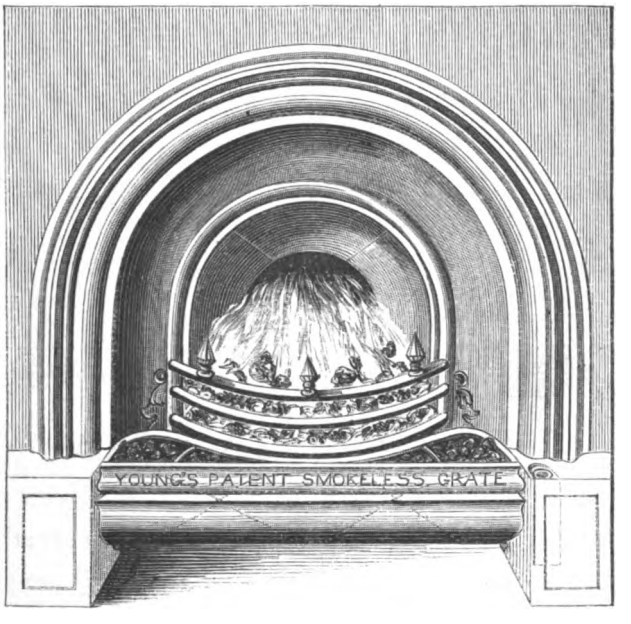
YOUNG, WILLIAM, 33 *and* 34 *Queen Street, Cheapside.*—Spirit and oil lamps; gas-burners; smokeless grates and furnaces.



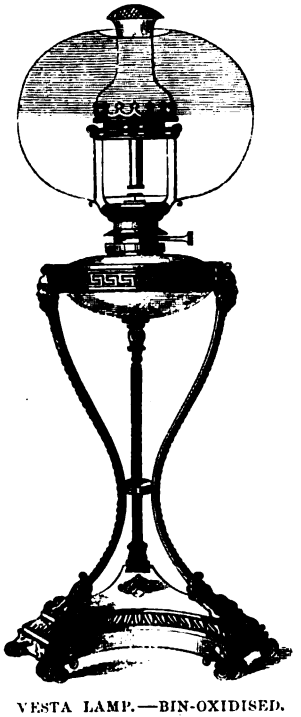
SMOKELESS GRATE.

THE SMOKELESS GRATE.

This patent smokeless grate consists of an ornamental trough being fixed at the lower portion of the grate, in which is placed a right and left handed screw connected with a ratchet at the side, which together with the screw is moved by the poker.

When the fire requires feeding, the coals are deposited in the trough, and by the revolution of the screw the burning fuel is raised up and the fresh coal conveyed into the cavity underneath. By this simple means the whole of the gases given off are burned, a great saving effected, and greater heat obtained combined with cleanliness.

This patent is also applied for kitcheners, furnaces, &c.



VESTA LAMP.—BIN-OXIDISED.

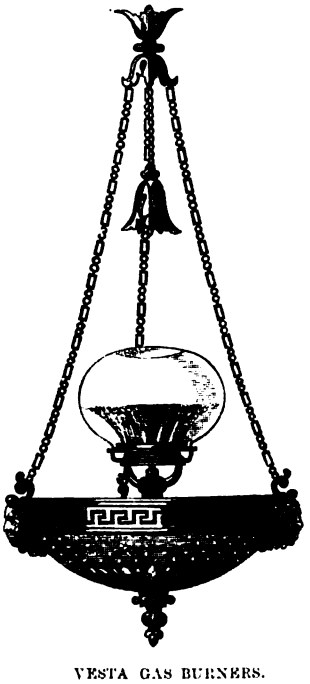
THE VESTA LAMP BIN-OXIDISED, constructed to burn rectified spirits of turpentine or other hydro-carbons.

This, the well known Vesta lamp, is now improved by the introduction of an apparatus termed a Bin-oxidiser, which apparatus is placed above the flame, and which causes a current of air to descend on the top part of same independent of the ordinary column of air passing through the burner, thus increasing the power and economy of light.

THE VESTA GAS BURNER AND PENDANT.

W. Young's Vesta gas burner consists of two or more deflectors being placed in the interior of the flame in such a manner that the column of air on its passage through the burner is taken up by the said deflectors and directed in separate currents upon the flame, consequently a more perfect combustion is obtained, and a great saving effected.

The above inventions may be seen in operation at W. Young's warehouse as per above address.



VESTA GAS BURNERS.

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[6266]

YATES, HENRY, & SONS, *Merridale Lock Works, Wolverhampton.*—Hand-made and machine-made locks, with specimens of ornamental keys.

[6267]

YORK, SAMUEL, & Co., *Wolverhampton.*—Hardware goods suitable for every foreign market. (*See page* 96.)

[6268]

YOUNG, WILLIAM, 33 *and* 34 *Queen Street, Cheapside.*—Spirit and oil lamps, gas-burners, and smokeless grates and furnaces. (*See page* 97.)

[6269]

AUBIN, C., *Wolverhampton.*—Nettlefold's guardian locks, and fancy keys.

[6270]

COTTRILL, E., *St. Paul's Square, Birmingham.*—Copying presses and dies.

[6271]

KENNARD, R. W., & Co., 67 *Upper Thames Street, London.*—Cast-iron park gates, and railing; verandahs, garden seats, &c.

[6272]

MOORE, J., *Birmingham.*—Medals.

BETTRIDGE, J., & Co., have been removed to Class XXX.

SUB-CLASS B.—*Manufactures in Brass and Copper.*

[6277]

ALDER, HENRY, *Grange Works, Edinburgh.*—Gas meters.

[6278]

ALDRED, WILLIAM, 28 *Pall Mall, Manchester.*—Non-corrosive ordinary and economical gas burners made from silver and other sheet metals.

[6280]

BENHAMS & FROUD, 40, 41, & 42 *Chandos Street, Charing Cross.*—Copper, zinc, and brass manufactures. (*See page* 99.)

[6281]

BIDDELL & Co., 108 *New Street, Birmingham.*—Enamelled, inlaid, ornamental metals, clays, glass; coated iron shot; thief detectors; alarms.

[6282]

BIDDLE, ELIZABETH EMILY, *Victoria Street, Birmingham.*—Book clasps; gilt rims and ornaments for books and cabinets.

[6283]

BISCHOFF, BROWN, & Co., *Langham Works, George Street, Great Portland Street, London.*—Hydraulic gas meter, with floating measuring chamber. (*See page* 102.)

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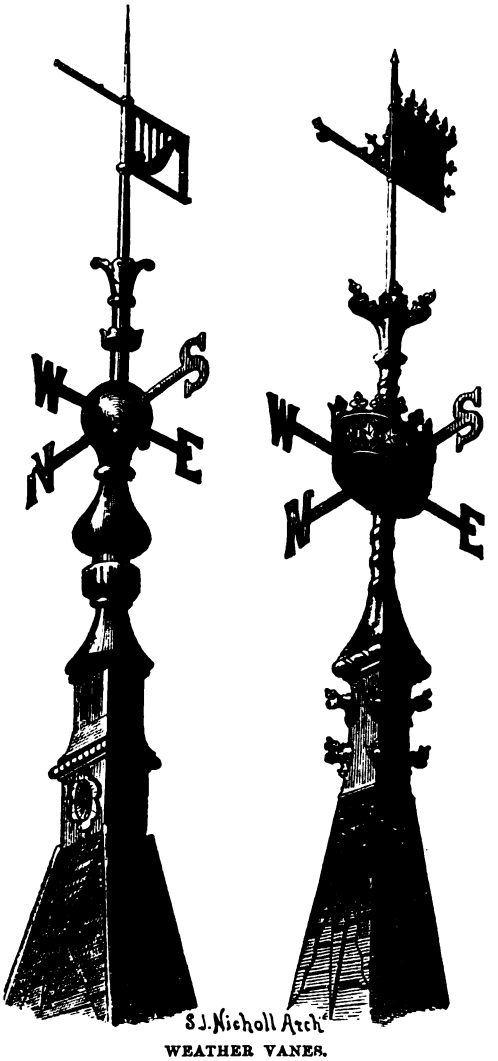
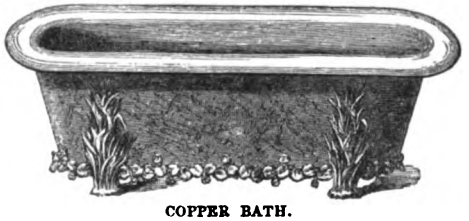
BENJAMS & FROUD, 40, 41, & 42 *Chandos Street, Charing Cross, London, W.C.*—Copper, brass, and zinc manufactures.



WEATHER VANES.

Copper, zinc, and iron weather-vanes of various styles. The two shown above are of wrought copper, from designs by Mr. S. J. Nicholl, architect.
Copper and zinc casement frames, plain and ornamental.
Bronzed copper glass-case frames.
Copper and zinc lanterns.
Copper architectural enrichments, for the exterior of houses or public buildings.
Specimens of zinc covering for roofs.
Ditto of copper ditto, recommended on account of lightness and durability.
Copper lightning conductors, solid, tubular, and rope, with platina tips.
Copper and zinc guttering, rain-water pipes, cistern-heads, &c.
Ornamental copper clock hands.

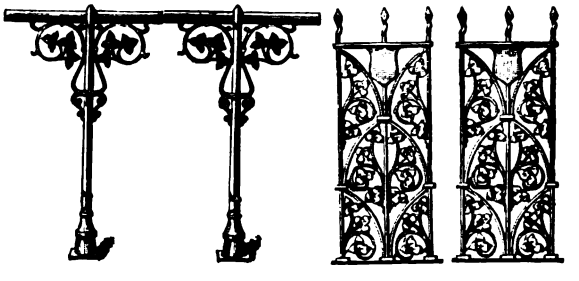


COPPER BATH.

Tinned copper bath, enamelled in imitation of marble, inside and out, designed for fixing without wood casing.
A 5 ft. 6 in. enamelled copper oblong bath, for fixing in wood casing, with set of cocks, lever handles, engraved brass plates, &c.
A full size polished zinc bath.
Copper shower baths.
Set of three tinned copper oblong steamers, for meat, fish, and vegetables.
Tinned copper stewpans, stockpots, saucepans, &c.

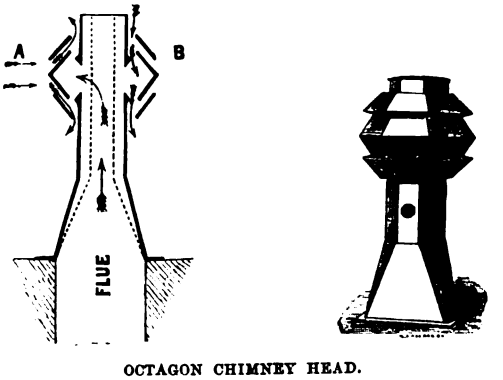
BRASS BRACKETS.

Tinned copper jelly and cake moulds, shown in various stages of the manufacture.
Copper and brass coal scoops.
Brass and copper mullers for publicans' use.
Copper saddle boiler.



ALTAR RAILS. TOMB RAILS.

Brass candlesticks, alms dishes, &c.
Ornamental polished brass brackets.
Brass altar and tomb rails.



OCTAGON CHIMNEY HEAD.

The new patent octagon chimney head.
Chimney pipes of various descriptions.

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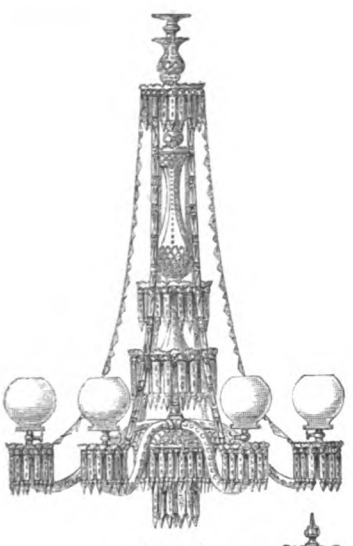
[6284]

BLEWS & SONS, 9, 10, 11, *and* 12 *Bartholomew Street, Birmingham.*—Chandelier, gas-fitting, lamp, standard weight, and measure manufacturers; bells and brass foundry articles.



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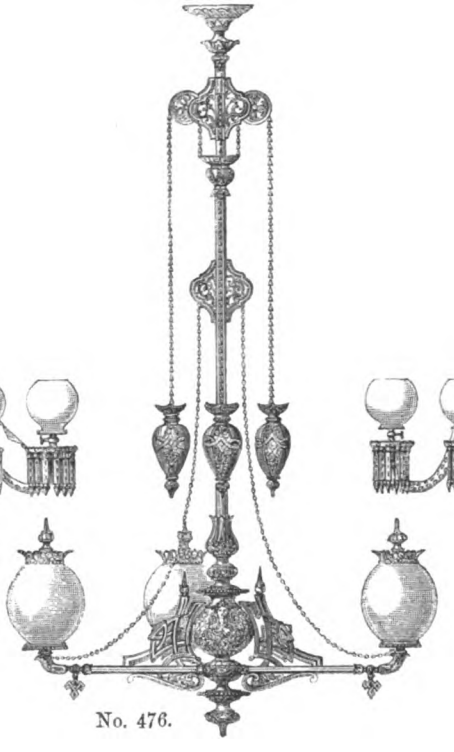

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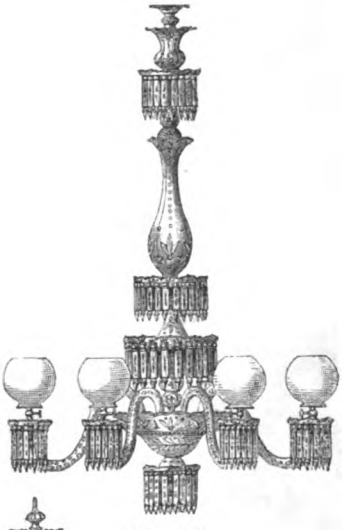

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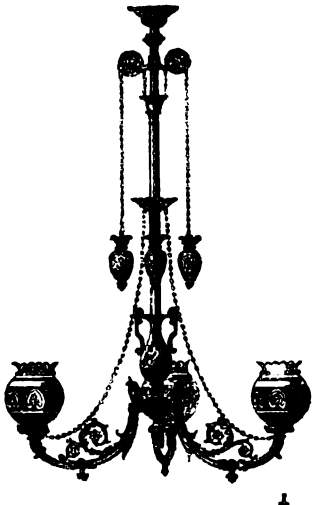

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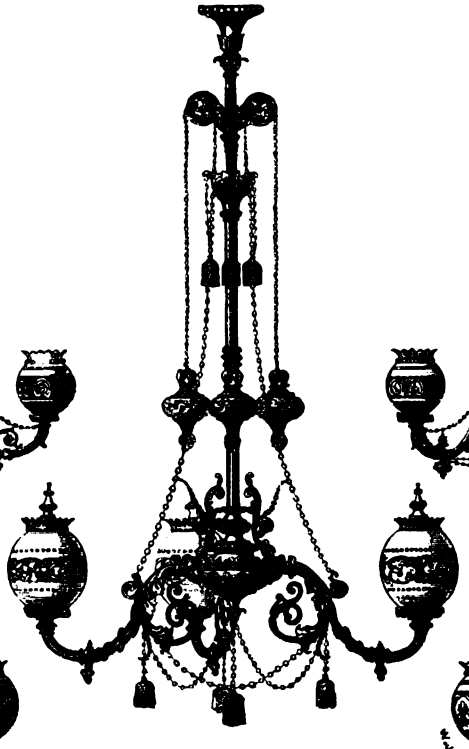

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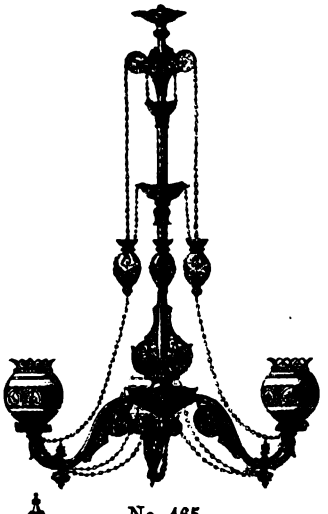

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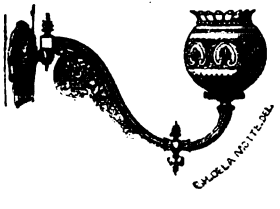

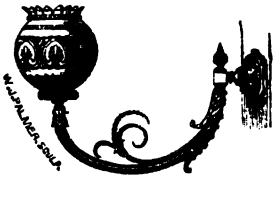

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BLEWS & SONS, *continued.* (In Birmingham Court.)

Established A.D. 1782. *Prize Medal awarded at Exhibition*, 1851.

A set of imperial standard measures, from a bushel down to ½ gill.

A set of imperial standard bell-shape brass weights, from 56 lbs. down to ¼ oz.

A set of imperial standard spherical-shape brass weights, from 56 lbs. down to 1 dram.

A set of imperial standard decimal troy weights, from 500 oz. down to $\frac{1}{1000}$ oz.

A set of cental weights, 50 lbs. down to ¼ oz.

A set of troy cup weights, each 256 oz. 128 oz. 64 oz. 48 oz. 32 oz. 24 oz. 16 oz. 12 oz. 8 oz. 4 oz. 2 oz. and 1 oz. down to ¼ oz.

A set of Spanish covered cup weights, each 8 lb. 4 lb. 2 lb. 1 lb. and ½ lb. down to ¼ oz.; making 16 lb. 8 lb. 4 lb. 2 lb. and 1 lb. in the whole.

A set of flat brass weights, each 7 lb. 4 lb. 2 lb. 1 lb. down to ¼ oz.

A set of bevilled-edge weights, each 4, 2, 1 lb. down to ¼ oz.

A set of registered knob weights, each 7, 4, 2, 1 lb. down to ¼ oz.

A set of frame weights, each 4, 2, 1 lb. down to ¼ oz.

A set of porcelain bell weights, 7 lb. down to ½ oz.

A turned and polished ship's bell, 22 inch diameter.

A turned and polished ship's bell, in brass frame, 7½ inch.

A railway station hand bell, turned and polished, with ebony handle.

A set of dinner bells, 3 inch to 6½ inch, turned edge and crown, with hardwood handles.

A set of dinner bells, 3 inch to 6½ inch, turned and lacquered, with ebony handles.

House bells, 6 to 24 oz. turned edges, and turned and lacquered.

Sheep bells, plain, and turned and lacquered.

Australian bullock bells, with mottoes, "Advance Australia," and "Success to Bullock Drivers."

Australian horse bells, with motto, "Success to Horse Teams."

METAL CHANDELIER,	3 light	No. 455A	£3	5 0
ditto	3 ,,	456	4	15 0
ditto	3 ,,	476	5	5 0
ditto	3 ,,	480	7	0 0
ditto	5 ,,	465	8	8 0
GLASS CHANDELIER,	3 ,,	800, plain, Queen's drops	4	15 0
ditto	3 ,,	800, cut, ditto	5	0 0
ditto	3 ,,	801, plain, ditto	4	10 0
ditto	3 ,,	801, cut, ditto	4	15 0
ditto	3 ,,	802, cut, ditto	5	10 0
ditto	3 ,,	803, cut, Queen's drops	5	10 0
ditto	3 ,,	804, plain, ditto	4	4 0
ditto	3 ,,	804, cut, ditto	4	10 0
ditto	5 ,,	805, cut, ditto	8	8 0
ditto	5 ,,	820, cut, Albert drops	9	9 0
ditto	5 ,,	850, cut, Queen's drops	9	9 0
ditto	5 ,,	860, cut, ditto	20	0 0
ditto	7 ,,	900, plain, ditto	11	11 0

The chandeliers are hung in the Court in the South-Eastern Transept, opposite Naylor, Vickers & Co.'s steel trophy.

Pattern books and price lists supplied on application.

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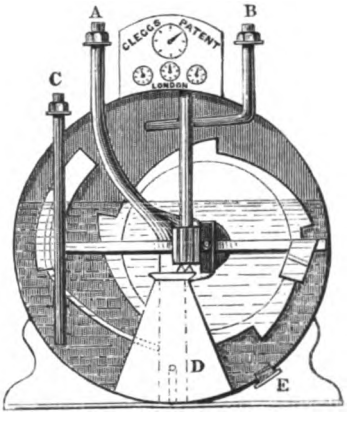
BISCHOFF, BROWN, & CO., *Langham Works, George Street, Great Portland Street, London.*—Hydraulic gas meter, with floating measuring chamber.



CLEGG'S NEW PATENT HYDRAULIC GAS METER.

The drum floats by means of a central air vessel, and thus renders the measuring capacity independent of any reduction of the water level by means of evaporation. The meter registers correctly under all variations of pressure, or increase and diminution of the number of lights.

[6285]

BRIGHT, RICHARD (Successor to Argand & Co.), 37 *Bruton Street.*—Argand and indicator lamps and wicks.

The PATENT INDICATOR LAMP has the following improvements :—

The position of a small bead shows when the plunger requires winding up. In filling the lamp, a bubbling shows when there is sufficient oil. A patent stiffened wick can be momentarily applied without a stick. The flame is regulated by raising or lowering the chimney without removing the globe. A double extinguisher renders it unnecessary to blow out the flame as requisite in moderator lamps.

[6286]

CARTWRIGHT, SAMBIDGE, & KNIGHT, *Lombard Street, Birmingham, and Castle Street, Holborn, London.*—Chandeliers, brackets, gas fittings, &c.

The exhibitors manufacture every description of gas fittings, gaseliers, &c. In the specimens exhibited, they have endeavoured to combine beauty of design with economy of cost, by producing such articles as come within the reach of the many rather than elaborate productions, which from their costliness could only be obtained by the few.

[6287]

CHAMBERS & CO., 216 *Bradford Street, Birmingham.*—Railway, ship, and carriage lamps, coach furniture, &c.

[6288]

COWAN, W. & B., *Buccleugh Street Works, Edinburgh.*—Wet and dry gas meters.

[6289]

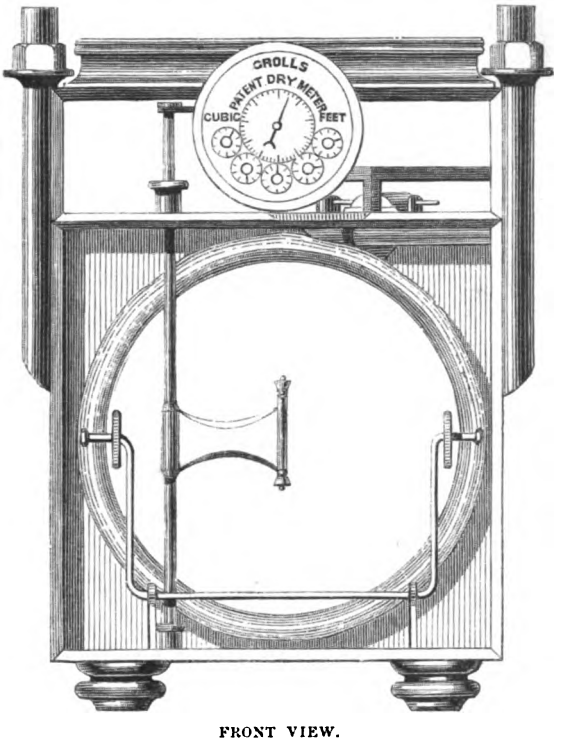
CROLL, RAIT, & CO., *Kingsland Road, N.E.*—Croll's patent improved dry gas meter, and gas apparatus. (*See page* 103.)

[6290]

DALE, RICHARD, & SON, 195 *Upper Thames Street.*—Copper boilers, copper baths, copper kitchen furniture.

Digitized by Google

CROLL, RAIT, & Co., *Kingsland Road, N.E.*—Croll's patent improved dry gas meter, and gas apparatus.



FRONT VIEW.

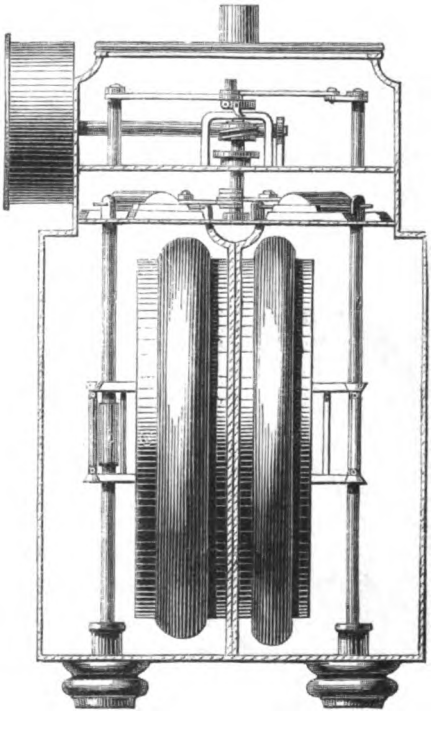
DRY GAS METER.

Extract from "Rutter on Gas-lighting."

"The dry meter I shall here endeavour to describe has been in use about fifteen years. During that period neither capital nor skill have been spared by its inventor and patentee, Mr. A. A. Croll, in his efforts to make it what it has now become—an accurate measurer, and a durable machine. This meter is not liable to be affected by sudden or extreme variations of temperature. It may be fixed in almost any part of the consumer's premises, either above or below the level of the entrance to the fittings, and it requires no adjustment to insure correctness."

The following articles are exhibited :—

1. Improved dry gas meter for 100 lights, made with glass front, sides, &c. to show the working.
2. Model of dry gas meter.
3. Parts of dry gas meter.
4. Model of a testing gas holder.
5. 20-light consumer's governor in glass, to show its action.
6. Public lamp meter in cast-iron case.



SIDE VIEW.

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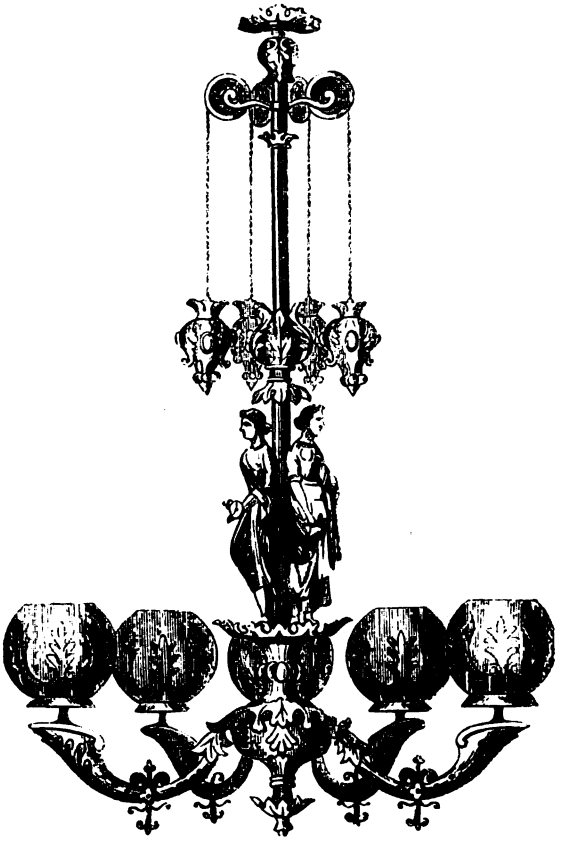
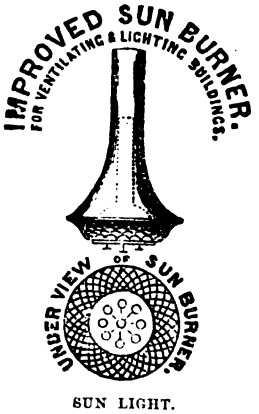
[6291]

DEFRIES, J., & SONS, *Works, London and Birmingham; Show Rooms,* 147 *Houndsditch.*—Brass chandeliers, bronzes, hall lanterns, brackets, &c.

J. DEFRIES & SONS, manufacturers of crystal, bronzed, and ormolu chandeliers; improved crystal star and sun lights.



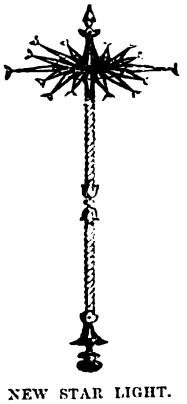
CHANDELIER.



SUN LIGHT.

Works: London and Birmingham. Principal depôt and show rooms, 147 Houndsditch, City.

Estimates. and designs for lighting theatres, public buildings, &c. can be had by applying at the above address.



NEW STAR LIGHT.

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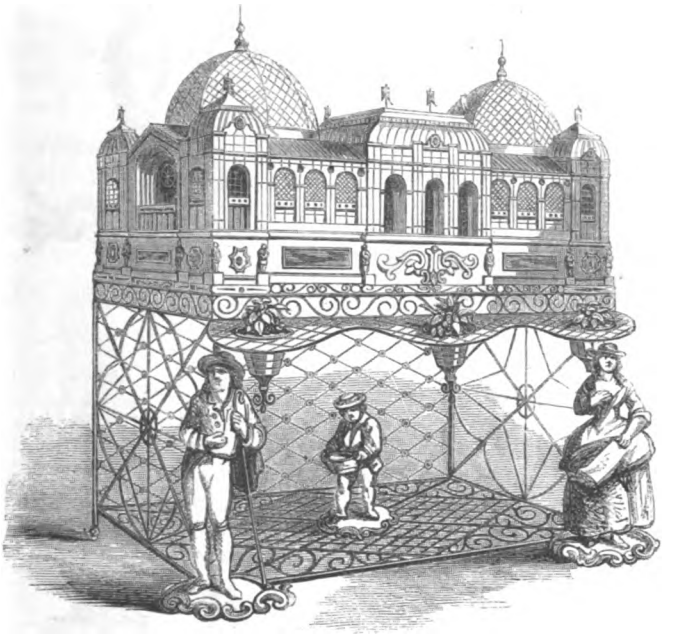
[6292]

DICKIE, CHARLES, *Dundee.*—Specimens of wire work; working models of improvements in bell hanging.



ORNAMENTAL WIRE AVIARY.

1. ORNAMENTAL WIRE AVIARY for birds, on ornamental wire table, frame of mahogany, embellished with carved figures, and four views on glass, representing the seasons, introduced in panels. The table has vases for four flower pots, and two hanging baskets, and is ornamented with bronzed figures and ornaments. Size of aviary 3 ft. 8 in. by 22 in. by 2 ft. 6 in. high. Height of table 2 ft. 9 in. represented in accompanying illustration. Designed and manufactured by C. Dickie.
2. GARDEN STOOL, handsome design in ornamental cast-iron and wire-work, with griffins and dolphins as supporters. Price . . . . . 12s.
3. ORNAMENTAL WIRE GARDEN CHAIR, strong, light, and elegant, and when inverted by a simple and easy movement, becomes a flight of four steps, very suitable for a conservatory. Price £1 5
4. ORNAMENTAL WIRE ARCH, for garden walk, gothic design.
5. HANGING FLOWER BASKET with drop.
6. WIRE FLOWER TRAINER.
7. ORNAMENTAL PANEL WIRE FENCING.

BELL-HANGING.

8. INDEX DIAL BELL, by which one bell only is required for any number of apartments.
9. MANIFOLD BELL PULL, by which one pull only is made to ring any number of bells.
10. ORNAMENTAL DESIGN BELL LEVER, constructed upon an entirely new principle, so as to ring three different bells.
11. New designs in DOOR BELL PULLS.

[6293]

DRURY, FRANCIS, 10 *Duke Street, Grosvenor Square, W.*—The Campanelian and musical inventions applicable to clocks.

[6294]

DUCKHAM, H. A. F., 44 *Clerkenwell Green.*—Compensating and regulating gas meters, wet and dry self-acting gas regulators.

[6295]

EDGE, THOMAS, *Great Peter Street, Westminster.*—One each wet and dry gas-meter in glass cases.

[6296]

EVERED, RICHARD, & SON, *Bartholomew Street, Birmingham, and Drury Lane, London.*—General brass foundry articles.

[6297]

FELE, J., & CO., *St. James' Square, Wolverhampton.*—Brass chandeliers, gas fittings, &c.

[6298]

FORREST, GEORGE, & SON, *Nevill's Court, New Street Square.*—Candelabrum and 32-light gas chandelier.

[6299]

GARDNER, HENRY & JOHN, 453 *Strand, Charing Cross,* 4 *and* 5 *Duncannon Street, and* 63 *Strand.*—Lamps, chandelier, candelabra, gas fittings and apparatus. (*See page* 106.)

[6300]

GLOVER, GEORGE, & CO., *Ranelagh Works, Pimlico.*—Dry gas meters, pneumatometers, and photometers. (*See page* 108.)

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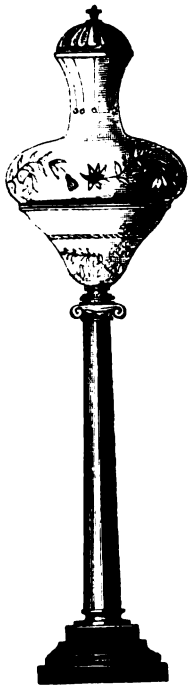
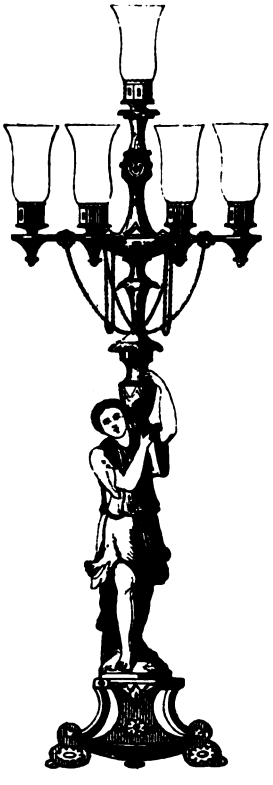
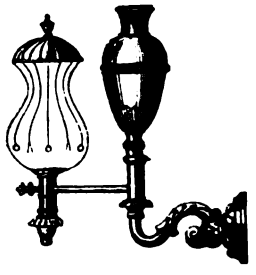
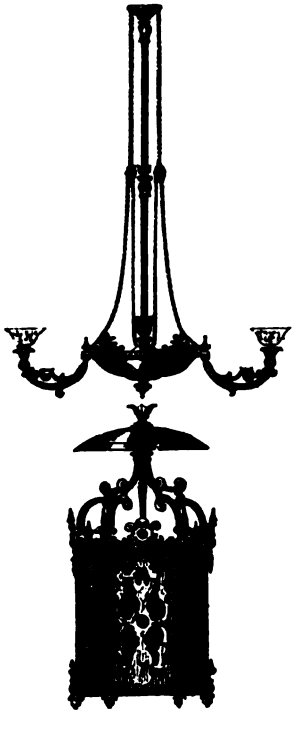
GARDNER, HENRY & JOHN, 453 *Strand, Charing Cross,* 4 & 5 *Duncannon Street, and* 63 *Strand.*
—Lamps, chandelier, candelabra, gas fittings, and apparatus.

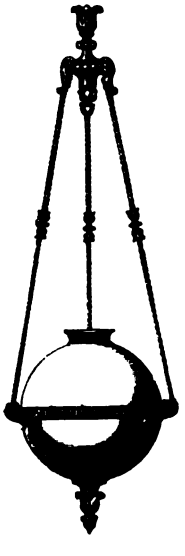
Obtained a Prize Medal at the Exhibition of 1851.

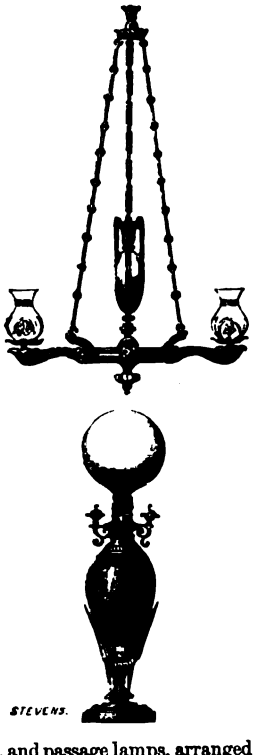












The exhibitors, whose business has been established for more than a century, hold a warrant of appointment as lamp manufacturers to the Queen. They manufacture and supply the following goods, of which specimens are exhibited :—

Lamps for India, of an improved construction, with punkah protectors, table lamps, chandeliers, candelabra, wall branches, hall lanterns, and passage lamps, arranged for both oil, gas, and candles, to suit any style of decoration, from the richest to the most moderate.

A considerable saving effected by using Gardner's improved gas regulator. Fittings, and gas apparatus of every description.

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[6301]

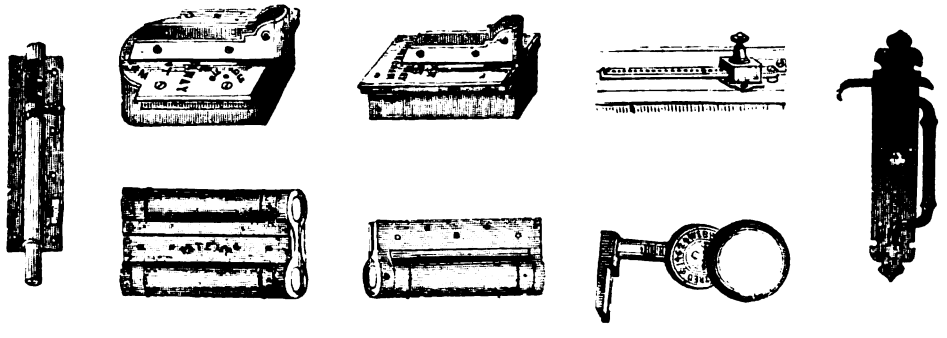
GLOVER, THOMAS, *Suffolk Street, Clerkenwell Green, E.C.*—Dry gas meters, and gas holders.

[6302]

GRAY, BAILEY, & BARTLET, *Berkley Street, Birmingham.*—Gaseliers, tea trays, coal vases, &c.

[6303]

GREENWAY, WILLIAM, *Princip Street, Birmingham.*—Locks, bolts, latches, door springs, fastenings, weavers' mails, patent wrought-iron hinges, &c.



The exhibitor is a manufacturer of—

Mortise, rim, drawback, dead, and pad locks.
Drawer, cupboard, chest, box, sideboard, and every description of cabinet locks.
Copper, brass, and gun-metal locks, suitable for iron and wood ships, or powder magazines.
Iron safe and prison door locks.
Winkler's patent secure safety locks.
Eastman's patent bolt and door fastener.
Greenway's patent barrel bolts.
Greenway's patent casement stays.
Greenway's patent cupboard turns.
Greenway's patent door springs.
Cartland's ditto ditto.
Dilkes & Co.'s ditto ditto.
Greenway's Gothic and other new pattern door latches.
Greenway's improved shutter bars and window fasteners.
Greenway's patent wrought-iron hinges.
Espagnolette and casement fastenings.
Copper, brass, and steel weavers' mails.
Lingoes and umbrella furniture.
Wrought, pressed, and cast-iron metal work, and general cast-brass work.

[6304]

GUEST & CHRIMES, *Rotherham, and 37 Southampton Street, Strand, London.*—Water-works articles. (*See page* 109.)

[6305]

HARDMAN, JOHN, & CO., 166 *Great Charles Street, Birmingham;* 13 *King William Street, Strand, London, W.C.;* 1 *Upper Camden Street, Dublin.*—Mediæval metal manufactures. (*See page* 110.)

[6306]

HARROW, WILLIAM, & SON, 14 *Portland Street, Soho, W.*—Specimens of manufacture; chandeliers, tripods, brackets, &c.

An 8-LIGHT CHANDELIER for gas, in brass, lacquered, designed and modelled by Mr. W. G. Rogers.
A 6-LIGHT CHANDELIER for gas. Fret ornament.
A LANTERN for gas. Fret panels and ornament.
A PAIR OF STANDARDS with six lights each for gas, in brass, bronzed.
BRACKETS, PILLARS, &c. in brass, bronzed and lacquered.

[6307]

HART & SON, *Wych Street and Cockspur Street.*—Ecclesiastical and domestic metal work (*See pages* 112 *to* 117.)

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GLOVER, GEORGE, & Co., *Ranelagh Works, Ranelagh Road, Pimlico; Offices, 22 Parliament Street, Westminster, and 15, Market Street, Manchester.*—Dry gas meters, pneumatometers, and photometers.

The construction of a good and durable dry gas meter involves a multiplicity of chemical and mechanical considerations, to each of which its due weight must be assigned.

A subtle, invisible, elastic, aëriform body, very complex in its chemical constitution, susceptible of change in condition and volume from slight variations in temperature and pressure, has to be accurately measured; and the result of that measurement must be correctly recorded.

The instrument must be self-acting, and must act continuously or at intervals, requiring no adjustment or interference of any sort.

All its parts which come in contact with gas must be made of anti-corrosive metal; while the materials, forms, and combinations of its different parts must be so adapted to each other, that, when put together as a whole, it shall work easily, steadily, and correctly.

These conditions are strictly observed in the manufacture of Messrs. George Glover & Co.'s patent dry gas meter; the same high standard of accuracy being adopted in its construction as in that of the national standard gas holders.

Since the "Sales of Gas Act," a much closer degree of accuracy in meters than that attained by those generally used hitherto is indispensable. The admitted range of error in wet meters of from 30 to 40 per cent. can no longer be tolerated.

The patent dry gas meter obviates all the objections to the wet meter.

1. It measures accurately, and does not vary in its registration.

2. It does not cause jumping or sudden extinction of the lights, the former a common source of annoyance, the latter not free from danger, especially in large assemblies and on railway lines, where signal lights are used.

3. The dry gas meter does not require to be opened that water may be put into it; thus escapes of gas from the plugs being carelessly left open, always offensive, and occasionally producing explosions, are averted.

4. It cannot be tampered with without showing distinct evidence of having been so; and it is thus free from the many temptations and facilities to fraud which are characteristic of the wet meter.

5. The dry meter does not allow the gas to pass without being registered, a source of much greater loss to gas companies than is commonly supposed, and caused by the water level falling to a point at which the gas passes unregistered.

6. The frequent supply of water now rendered necessary by the small range of error allowed by the Act, the vigilant attention required to prevent fraud, and to ascertain when the gas is passing unregistered, needs three times the number of Inspectors requisite where dry meters are used; whilst, in testing meters, the expense of Inspectors and instruments is three times larger with the wet than the dry meter, which thus effects a great saving to Gas Companies and local authorities.

7. It does not require to be placed in the basement or lower part of the house, but may be put anywhere. The attempt with wet meters to prevent jumping of the lights by giving all the pipes a gradual ascent from the meter, so as to admit of the water trickling back into it, besides being impracticable, is expensive and detrimental to house property.

8. The dry meter works with less pressure than the wet. Not only is a saving of gas thus effected, but in large cities when, during the winter season, dense fogs occur, and the low pressure in the mains during the day is not adequate to move the wet meters so as to supply enough of gas for the burners, and only small smoky flames can be obtained from them, with the dry meter there is sufficiency of light. Thus interruptions to business, occasioning considerable loss to the owners of large warehouses, mills, and factories, are averted.

9. The action of the dry meter cannot, like that of the wet, be arrested by frost, causing the total extinction of the lights. This makes the dry meter especially advantageous on railway lines, precluding as it does the necessity of keeping up large fires near the meter during a severe and protracted frost.

10. Made of anti-corrosive metal, and not subject to the corrosive power of the chemical constituents of coal-gas and water, the patent dry gas meter is a much more durable instrument than the wet.

The dry gas meter has been brought to its present condition of excellence by successive stages. The essential improvements, invented by Mr. William Richards, and patented by Messrs. Croll & Richards in 1844, consisted in the introduction of the diaphragm and the direct action of the disc. The theoretical accuracy of the principles which the invention of Mr. Richards involved time and experience have fully established. The patentees, however, failed to reduce those principles to practice in producing a good and durable dry gas meter, and they abandoned its manufacture.

Mr. Croll having secured the patent, Mr. Thomas Glover, in 1845, commenced the manufacture of the meter as Croll & Glover's patent dry gas meter, and ultimately he manufactured it as his own. To him belongs the merit of having imparted to Mr. Richards' invention a real and practical value by the production of a correct and durable instrument. Some 200,000 of his meters have been manufactured; the medal was awarded them at the Exhibitions of London, Paris, and New York; they are now in extensive use all over the world, and imitated by other meter makers.

Improvements in Messrs. Geo. Glover & Co.'s meter:—

It has a large and distinct dial, which shows at a glance the number of cubic feet of gas passed, the number of the meter's capacity per hour and per revolution, and the number of identity, all of which the "Sales of Gas Act" requires, the maker's name, and the date of its manufacture. These points of information are inscribed on an enamelled dial in characters easily read and indelible; and they are necessary for reference, especially when disputes arise between buyer and seller, in which case the marks of identity and capacity are essential. These ought not to be entrusted to flimsy badges of thin metallic substances, which become tarnished and illegible, accidentally fall off, and can easily be transposed for the purposes of fraud.

A slot is introduced and a pin which connects the valve and valve rod. This facilitates the adjustment of the two sets of valves necessary to the uniform flow of gas, without which steady lights cannot be obtained. The attempt to adjust the position of the valve pin by giving a curvature to the valve arm is very objectionable. The valve arm has to be made soft so as to admit of this finger and thumb adjustment, its protracted immersion in gas rendering it still softer. The result is that the rod becomes more or less curved during the action of the meter as it transmits force, in the direction of its length, as a thrust or as a pull alternately.

A slot is introduced in the tangent of the meter, and a shoulder or rest is placed on the tangent pin, the flat surface of which rests on the upper surface of the tangent. The pin is secured in its place by a screw from below, the flattened head of which fixes it firmly at any desired point of the slot. This arrangement keeps the pin in a perfectly vertical position, and admits of the meter being registered with ease and precision.

Messrs. George Glover & Co. have made a modification of their meter, adapting it to the photometer, which shows its extreme accuracy in measuring the most minute quantities of gas. All the wheel-work, the spindle, and the worm are removed. The dial is placed on the top of the meter, a pointer is fixed in connexion with the crank rod, and the measurement of the gas is taken directly from the revolution of the crank. This pointer passes round a disc 6 inches in diameter, the scale of which is so divided that the $\frac{1}{600}$th part of a cubic foot of gas can be indicated with precision each second. This is the most severe test to which the steadiness, uniformity, and accuracy of a meter can be subjected. (In Class X. No. 2291, and Class XXXI. No. 6300, International Exhibition, it is seen at work.)

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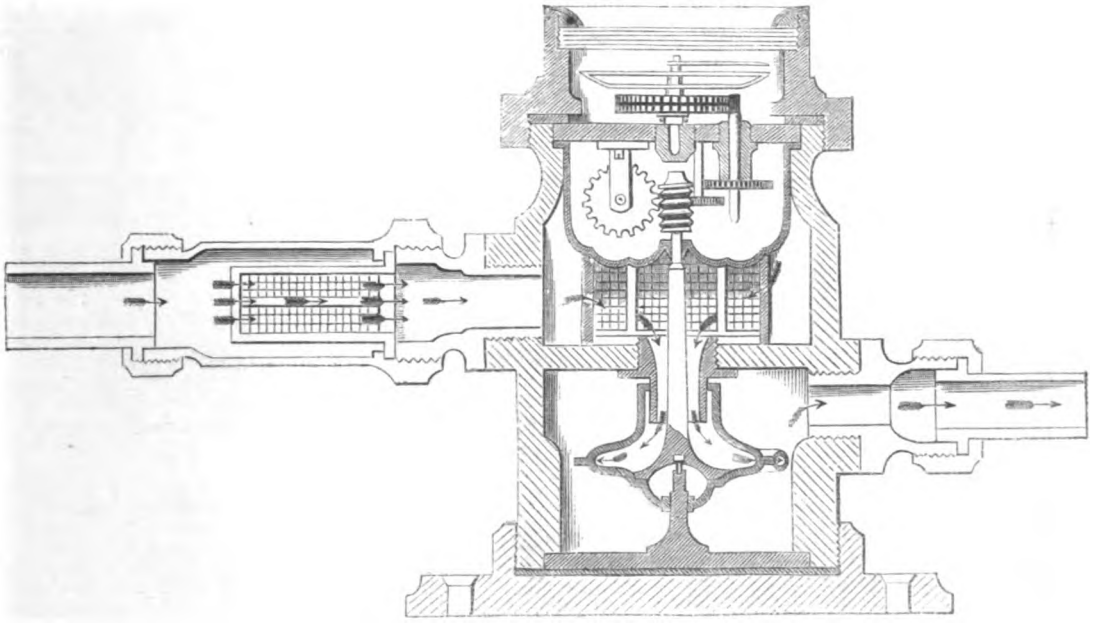
GUEST & CHRIMES, *Rotherham, and* 37 *Southampton Street, Strand, London.*—Water-works articles.



SIEMEN'S AND ADAMSON'S PATENT WATER METER.

The following is a list of the manufactures of GUEST & CHRIMES :—

Bateman & Moore's & Chrimes' patent hydrants or fire cocks, improved sluice cocks and gas valves.

Chrimes' patent high-pressure single and double loose valve and screw-down cocks.

Pilbrow's patent water-waste preventer; patent absolute water-waste preventer.

Siemens' patent balance water meter.

Bell & Chrimes' patent service box valve; improved self-acting and pull water-closet.

Eskholme's patent pneumatic regulator and valve closet.

Lowe's patent effluvia traps, Beggs' improved.

Fire-extinguishing apparatus.

Galvanized iron tubes and fittings.

Gas chandeliers, brackets, and fittings; glass chandeliers and brackets.

Crossley & Goldsmith's patent wet gas meter.

All the above articles may be seen on application to THOMAS BEGGS, 37 Southampton Street, Strand, London; or to the exhibitors.

They also execute plumbers' and gas fitters' brass-work of every description.

Agents for Scotland, Donaldson & Hume, 23 St. Enoch Square, Glasgow. Agents at Hamburgh, Messrs. Alfred Barber & Co.

Drawings, descriptions, prices, and testimonials, will be forwarded per post on application to Mr. BEGGS, 37 Southampton Street, Strand, or to the Works, Rotherham.

[6308]

HARVEY, THOMAS, 13 *Bradford Street, Walsall.*—Brass and plated harness furniture; South American spurs, stirrups, &c.

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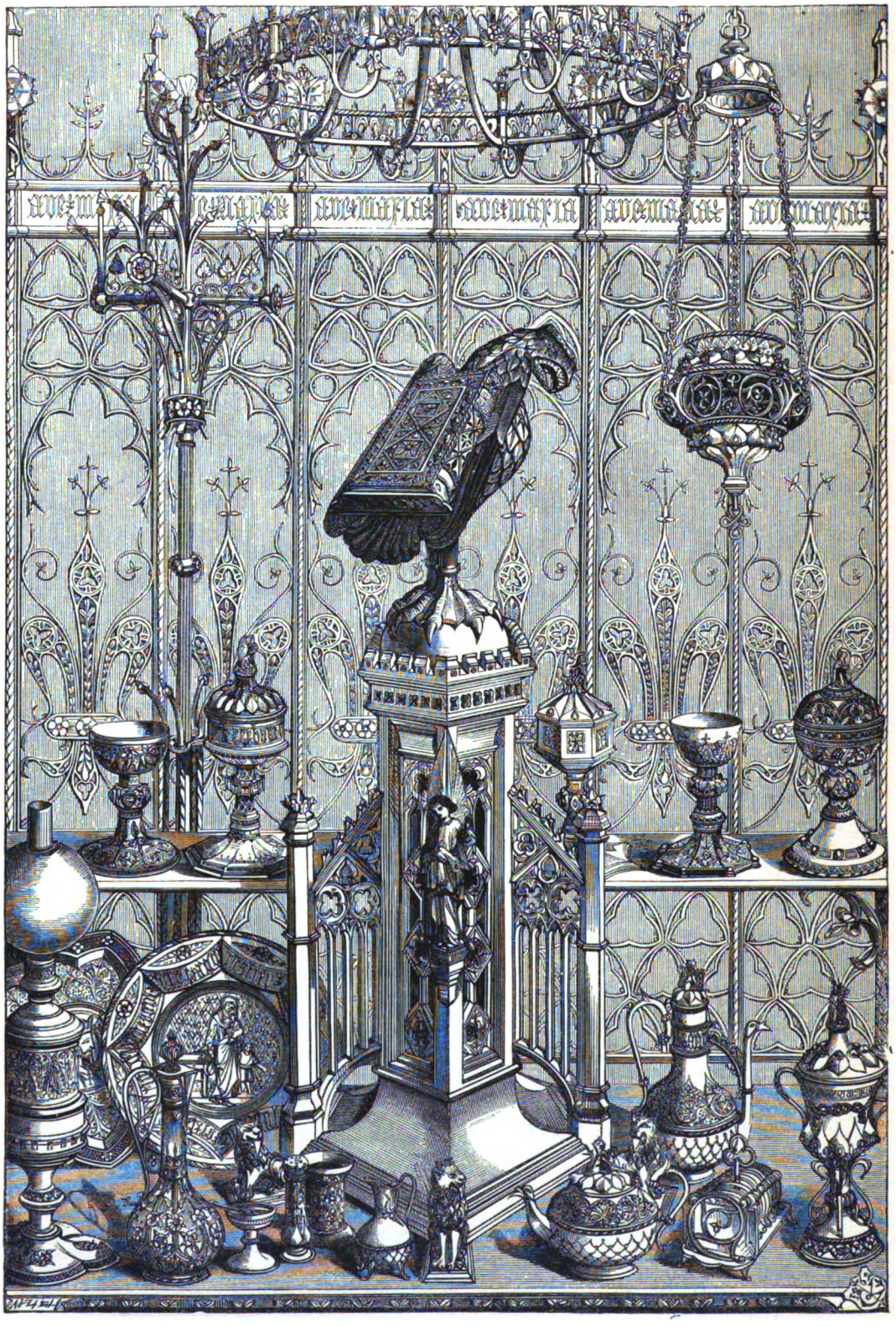
HARDMAN, JOHN, & CO., 166 *Great Charles Street, Birmingham;* 13 *King William Street, Strand, London, W.C.;* 1 *Upper Camden Street, Dublin.*—Mediæval metal manufactures.



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[6309]

HICKLING & COX, *Birmingham.*—Copper and iron boat nails, rivets, and washers; cut copper and zinc tacks, screws, &c.

[6310]

HICKMAN, JOHN, 34 *William Street North, Birmingham.*—Brass cocks.

[6311]

HILL, JOSEPH, 18 *Broad Street, Birmingham.*—Chandeliers, gas fittings, stampings for metallic bedsteads, &c. (*See page* 118.)

[6312]

HIND, JAMES, 118 *Kingsland Road, London.*—Engraved and inlaid metals in door-plates and monumental brasses.

[6313]

HINKS, JAMES, & SON, *Crystal Lamp Works, Birmingham.*—Lamps for burning hydro-carbon oils.

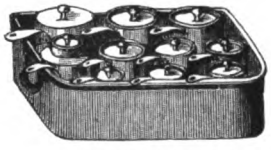
[6314]

HOLDEN, H. A., *Bingley Works, Birmingham.*—Railway lamps and signals, and railway carriage fittings.

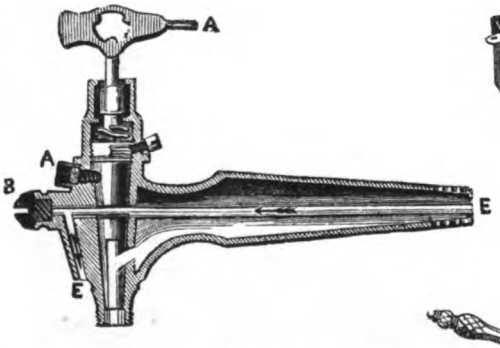
[6315]

HORSEY & BAKER, *Worcester Street, Southwark.*—Tea urns, coal-scoops, washing and brewing coppers, copper cooking utensils, patent wine and beer taps with steel protectors, white-metal taps with patent brace, preserving them from injury and breakage.

COPPER BRAIZING PAN.



BAIN-MARIE PAN, WITH STEW-PANS, &c.



HORSEY, BAKER, & HURST'S PATENT SELF-ACTING WHITE-METAL AND ELECTRO-PLATED WINE AND BEER TAPS, with iron protector, extra lock, bottling tube, and perfect syphon.

IMPROVED ROYAL SCOOP AND SHOVEL.

HAVELOCK SCOOP AND SHOVEL.

The exhibitors keep a large and well-assorted stock of tea urns, copper coal scoops, bath tubs, and other articles for domestic use of improved shapes and constructions.

They are patentees of a tap, fitted with a steel protector, and having a double lock, for wine, beer, cider, &c.

[6316]

HUGHES, RICHARD HUGH, *Atlas Works, Hatton Garden.*—Patent safety Atlas indicating chandeliers.

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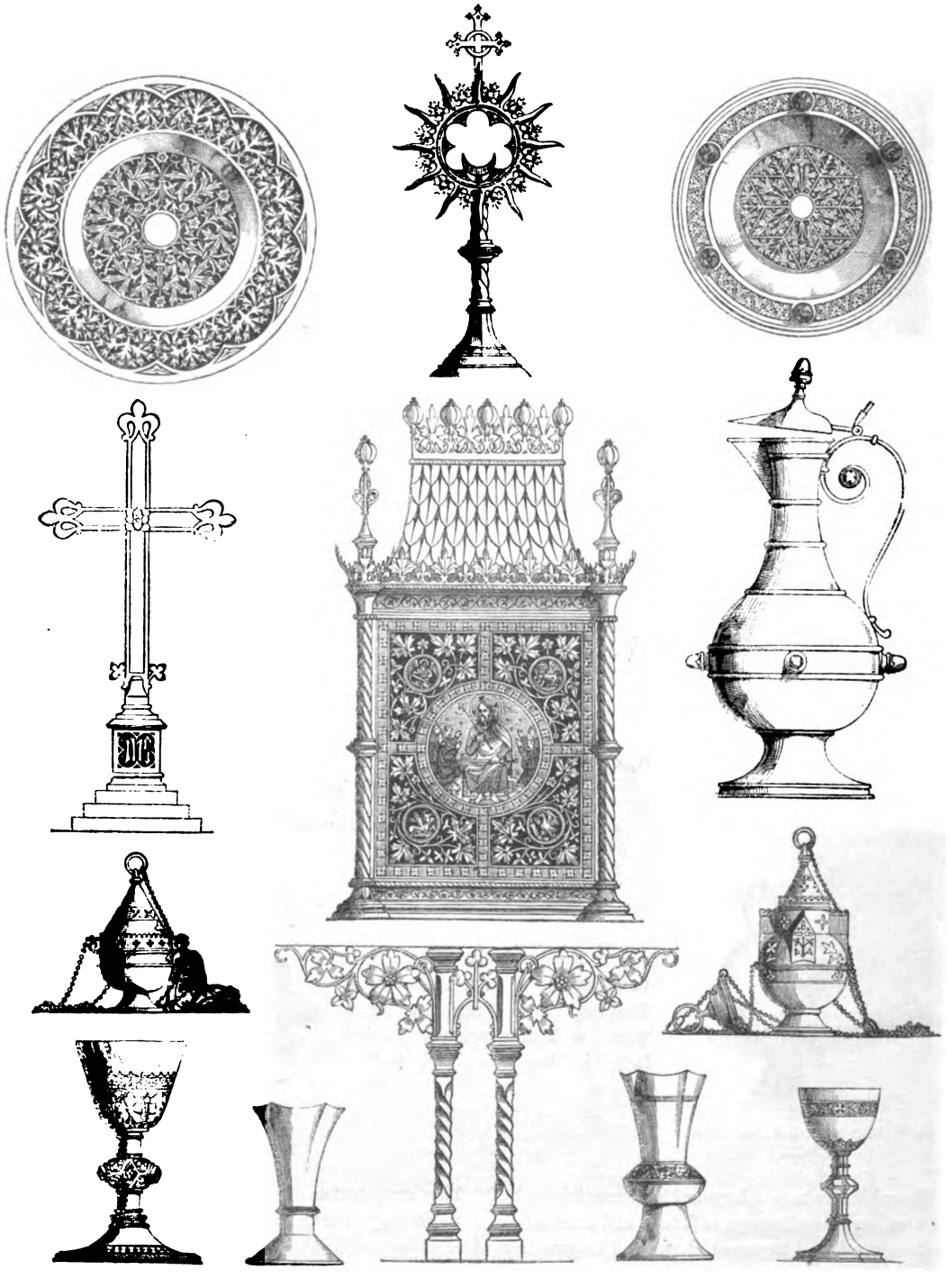
HART & SON, *Wych Street and Cockspur Street.*—Ecclesiastical and domestic metal work, iron, brass, silver.



Manufacturers of every description of silver, brass, and wrought-iron metal work in the mediæval style, both for ecclesiastical and domestic uses, comprising chalices, patens, monstrances, pixes, ciboriums, flagons, tabernacles, benediction crowns and branches, sanctus bells, thuribles, croziers; altar, processional, oratory, and

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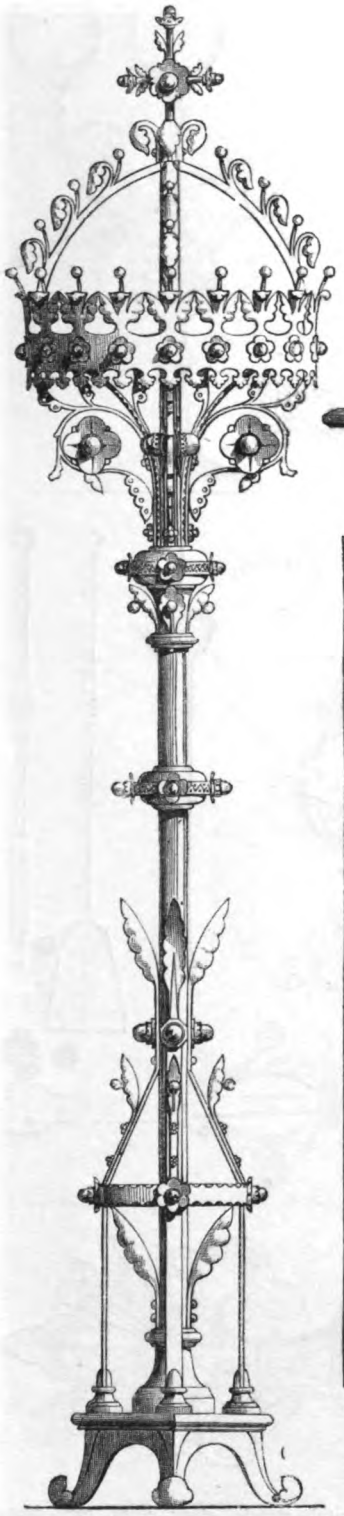
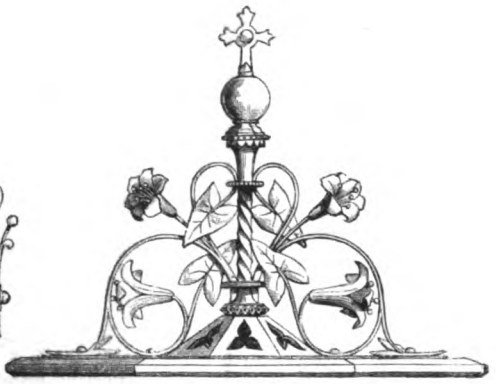
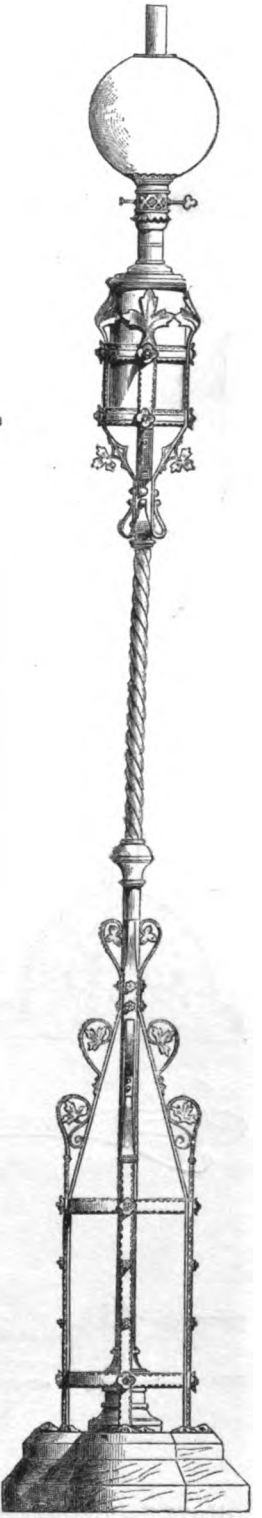
HART & SON, ***continued.***







pectoral crosses; altar, gospel, and elevation candlesticks; flower vases, portable communion services, alms basins and boxes, font covers, altar and font rails and standards, chancel chairs in oak and metal, lecterns and book rests, metal screen work, and every description of ecclesiastical furniture.

Engravers of monumental brasses and heraldic devices.

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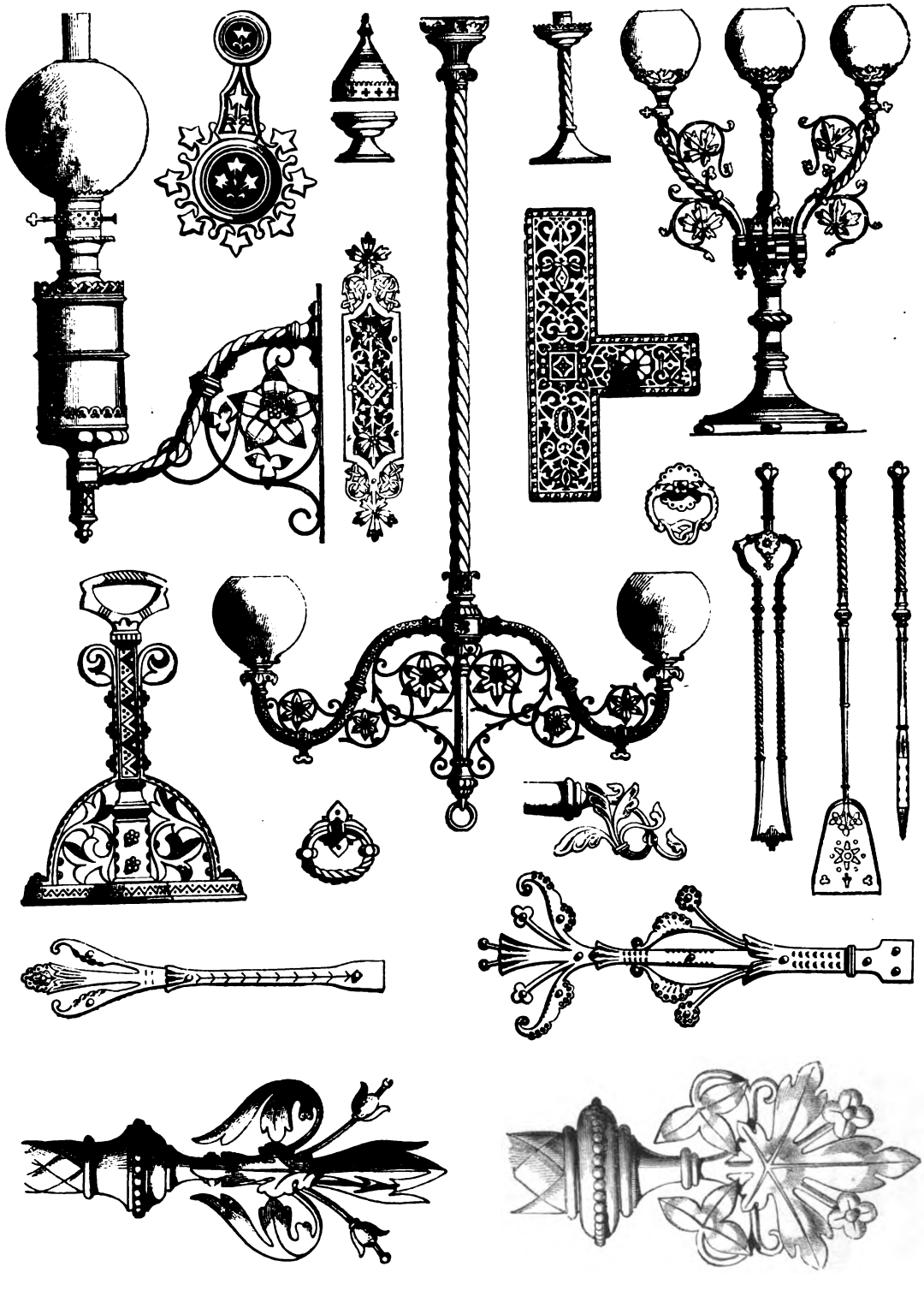
HART & SON, *continued.*



Hart & Son have devoted special attention to domestic metal work; their stock includes chandeliers, gas, oil, and candle pendants; candelabra in brass, electro-silver, and gilt; gas, oil, and candle standards for halls, corridors, stairs, &c. pastile burners, call bells, inkstands in all metals, watch stands, clock cases, card trays, salvers, hall lanterns, billiard lights, cabinet hinges and fittings, door hinges, knobs, and plates, bell pulls and levers, cornice poles, ends, and brackets; tea and coffee services in silver and electro-plate.

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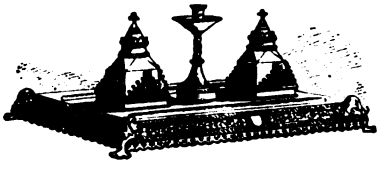
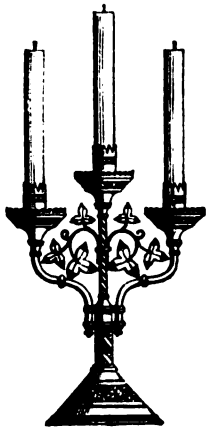
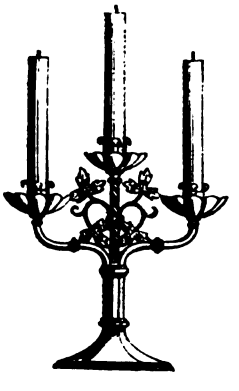
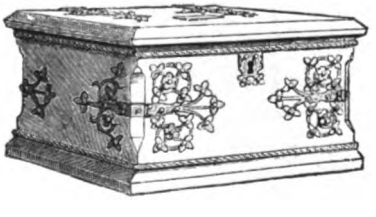
HART & SON, *continued.*









Hot-air stoves, register and dog grates, fenders and fire irons, wrought gates and grilles, gable and spire terminals and vanes, boundary and tomb railing, mortuary crosses, out-door lamps, brackets and posts, &c.

Specimens may be seen in the South Court, and at the West Side of London Metal Workers' Trophy.

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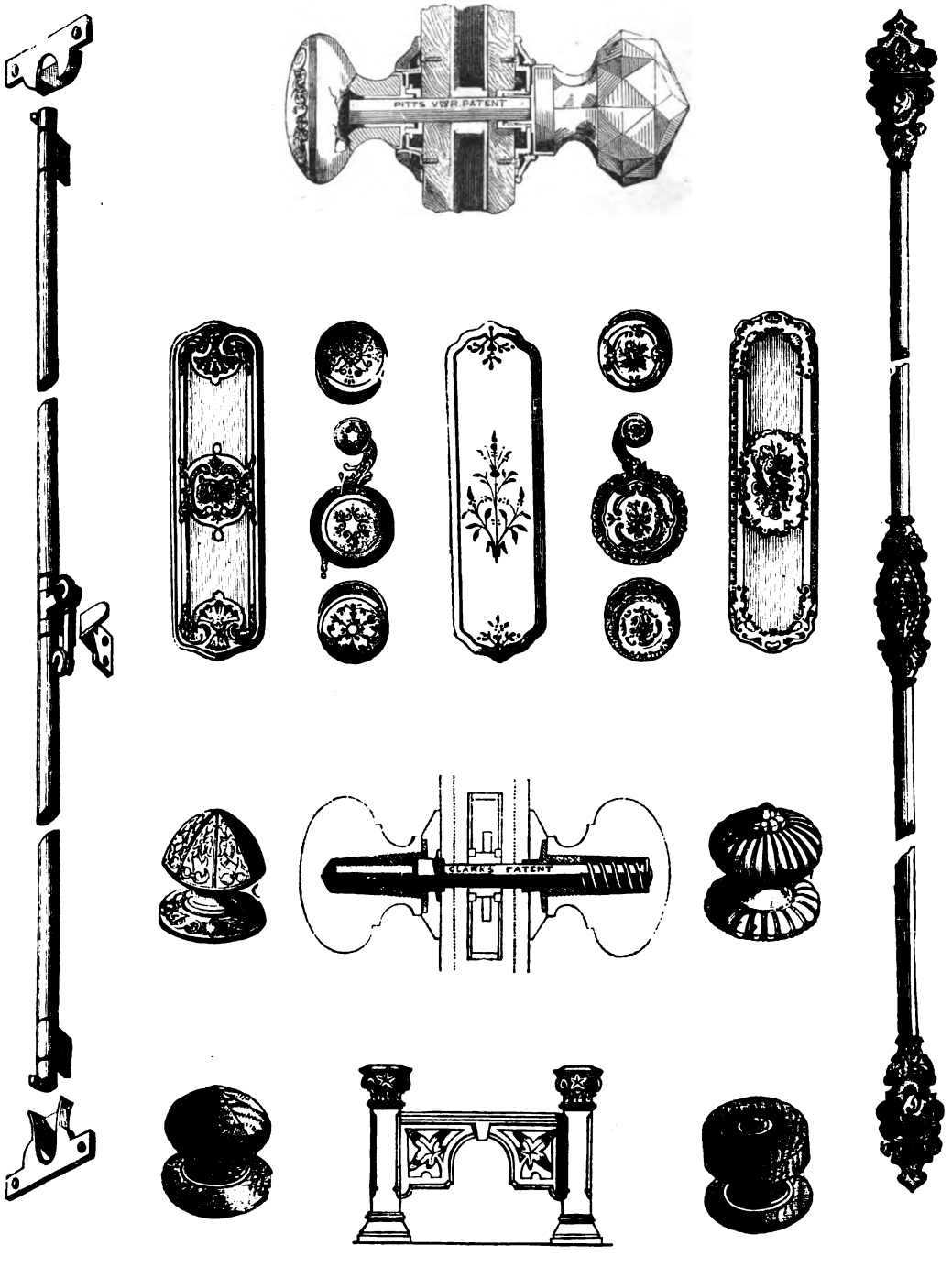
HART & SON, *continued.*



Manufacturers of Pitt's patent self-adjusting, and Clark's patent spindled door furniture, in china, glass, brass, and wood; and finger plates, bell pulls, shutter knobs, &c. en suite.

Manufacturers of espagniolette and double-action bolts, weather bars, stays, and fastenings, suitable for every description of casements.

A large assortment of general ironmongery, suitable for the colonies.

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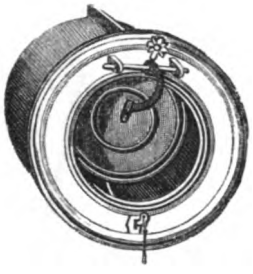
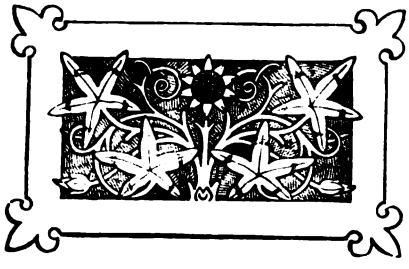
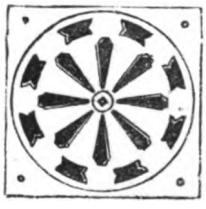
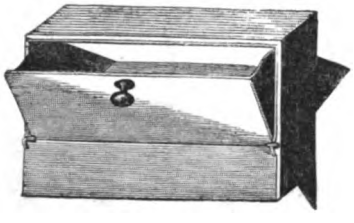
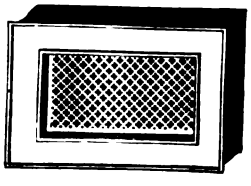
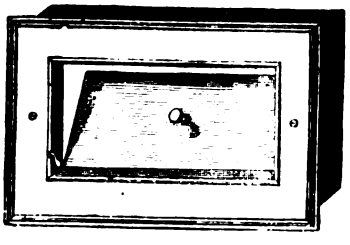
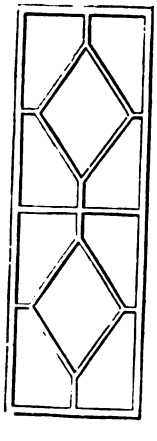
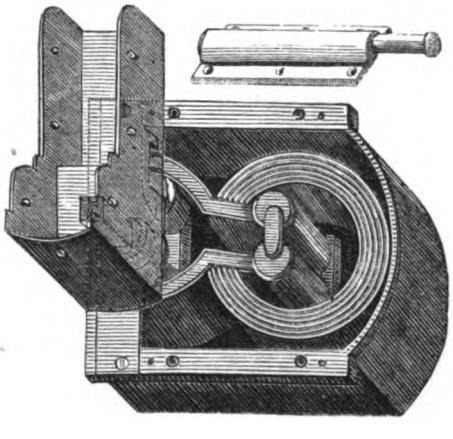
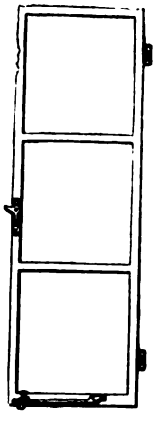
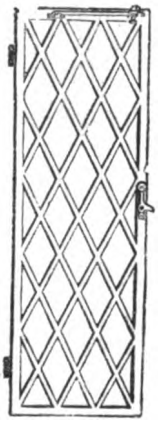
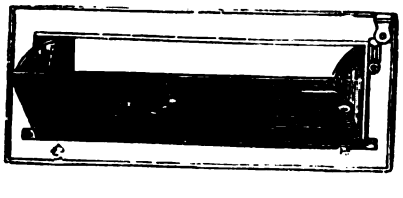
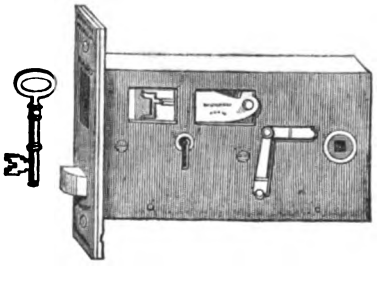
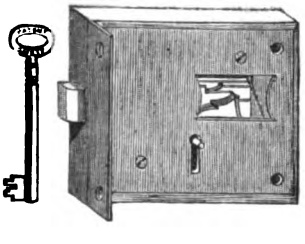
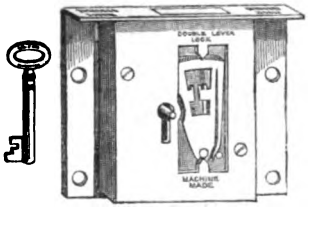
HART & SON, *continued.*

Manufacturers of Arnott's and Sheringham's ventilators, sliding and revolving ventilators of every description, ornamental air bricks, improved floor centres for swing doors and buffer springs ; wrought-iron casements suitable for cottages, levered, mortise, rim, and till locks, latches, &c. and every description of general ironmongery.

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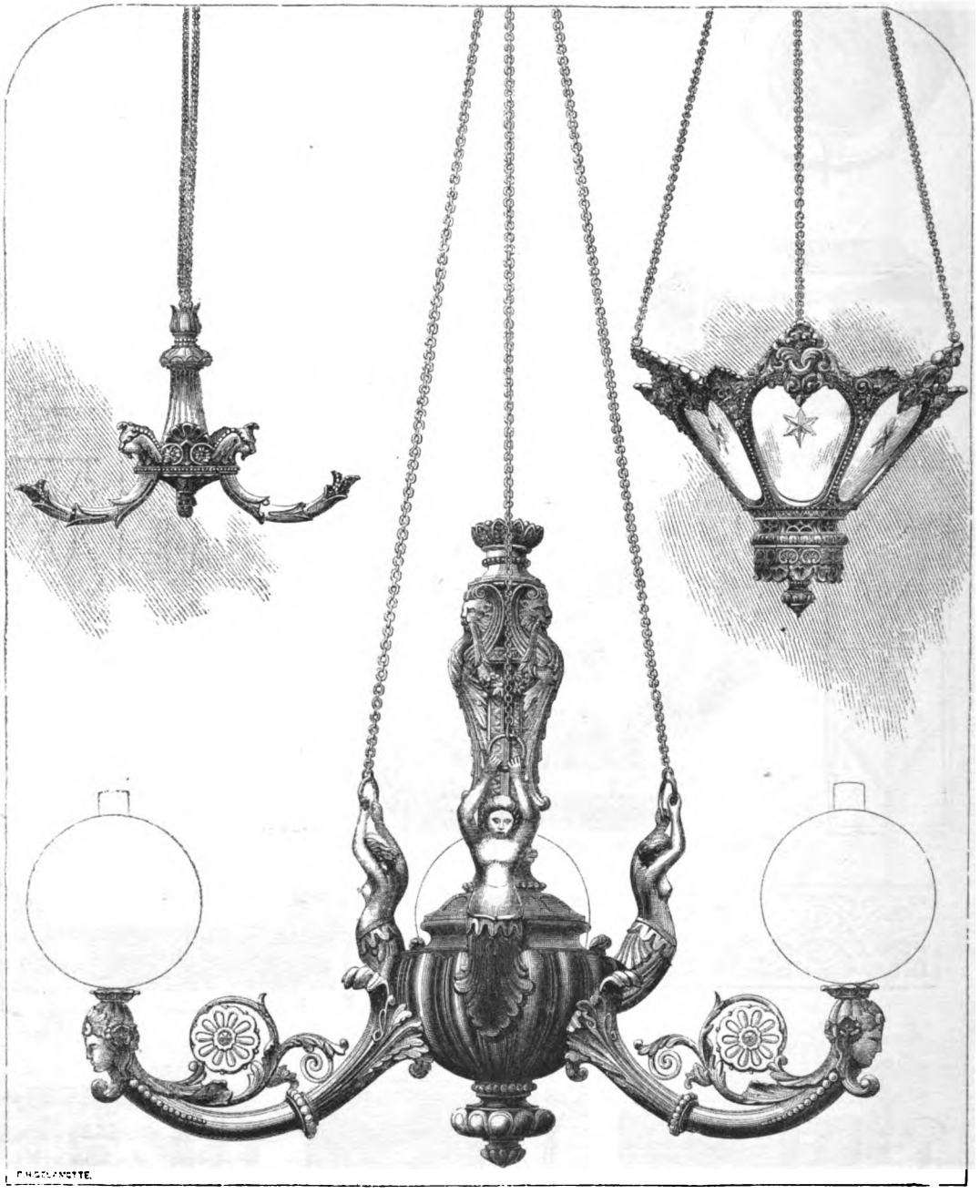
HILL, JOSEPH, 18 *Broad Street, Birmingham.*— Stampings, chandeliers, gas fittings, metallic bedsteads, &c.



CHANDELIERS.

ORNAMENTAL STAMPINGS for lamps, chandeliers, and general gas-fittings.
HUSKS and VASES for metallic bedsteads.

CEILING ROSES in various styles and sizes, finished in white and gold and other colours.

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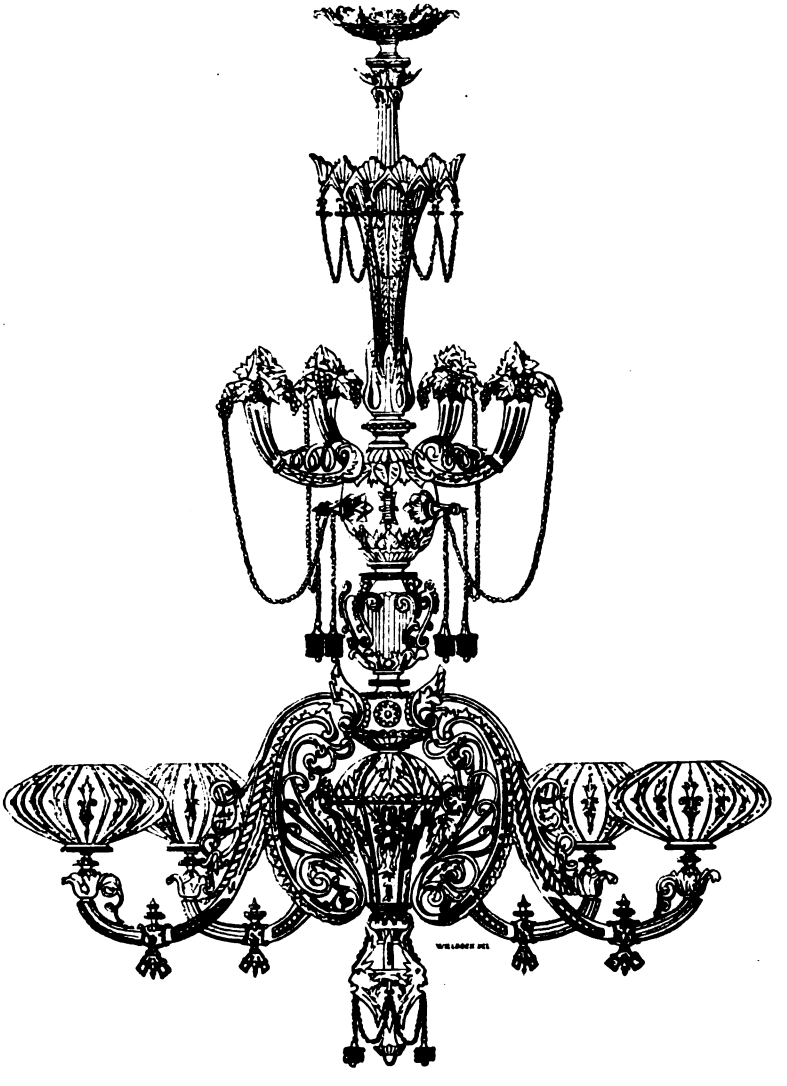
[6317]

HULETT, D., & Co., 55 & 56 *High Holborn.*—Gas-fittings.



A GASELIER IN THE RENAISSANCE STYLE.

GASELIERS, HALL LANTERNS, &c. in glass, ormolu, and bronze.

Hulett & Co. manufacture improved gas meters, station and experimental meters, governors, pressure registers, gauges, &c.

D. Hulett's improved service cleanser, for clearing out services, gas fittings, &c.

The above engraving is a representation of a gaselier in the Renaissance style, designed and modelled by the exhibitors.

Inventors and patentees of the mercurial gas regulator, sole manufacturers of Church & Mann's improved photometer, the registered convex silvered glass reflecting light, Arnott's improved ventilators, Carter's valves, high pressure cocks, and all kinds of gas and steam fittings, and every description of gas apparatus.

Prospectuses may be obtained on application at the Manufactory, 55 & 56 High Holborn.

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[6318]

JENN, JOSEPH, JUN., 38 *Whittlebury Street, Euston Square.*—Moulds for pound-cakes.

[6319]

JOHNSTON, BROTHERS, 190 *High Holborn, London.*—A standard gaselier for a cathedral, designed by Mr. G. Trufitt.

[6320]

LAMBERT, THOMAS, & SON, *Short Street, New Cut, Lambeth.*—High-pressure valve cocks, &c. (*See page* 121.)

[6321]

LEALE, A., 4 *Litchfield Street, W.C.*—Various designs of copper vanes, weathercocks, and of cake and jelly moulds.

[6322]

LEONI, S., 34 *St. Paul's Street, N.*—Knife handles, castor-bowls, taps, gas burners, ornamental wares, of adamas, resisting wear, acids, and heat, and of great durability.

[6323]

LOYSEL, EDWARD, C. E. 92 *Cannon Street, London, E.C.*—Loysel's hydrostatic percolator, keyless locks, portable hot-air ovens, reflecto-culinarium. (*See pages* 122 *and* 123.)

[6324]

MACKEY, CHARLES, *Great Hampton Row, Birmingham.*—Brass knobs, vases, furniture ornaments, &c., for various purposes.

[6325]

MARRIAN, JAMES PRATT, *Birmingham.*—Lamps and various goods in brass for the fitting-up of ships.

[6326]

MATTHEWS, E., 377 *Oxford Street.*—Engraving in metal for ecclesiastical decoration and other purposes.

[6327]

MESSENGER & SONS, *Broad Street, Birmingham.*—Chandeliers, candelabra, and general gas fittings, &c.

[6328]

MIDWINTER, EDWARD, & Co., 68 *Snow Hill, London.*—Brown and bright copper tea-urns, tea-kettles, coal-scoops, &c.

[6329]

NAYLOR, JAMES, *Radnor Street, ulme, Manchester.*—Lamps for pillars, brackets, and for suspending from ceilings.

[6330]

NORTH, E. P., 6 *Exeter Row, Birmingham.*—Ornamental metallic panelling.

[6331]

NUNN, WILLIAM, 179 *St. George Street, E.*—Signal lanterns and lenses. (*See pages* 124 *and* 125.)

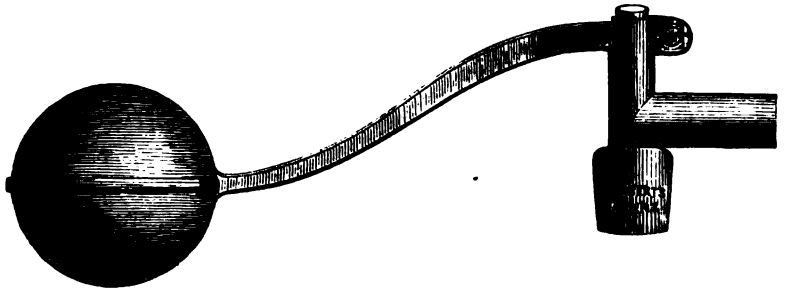
[6332]

OERTON, FRANCIS B., *Walsall.*—Carriage lamps, axles, springs, handles, and fittings of all kinds.

Digitized by Google

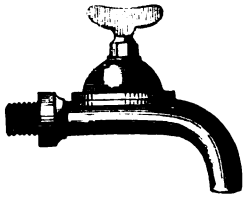
LAMBERT, THOMAS, & SON, *Short Street, New Cut, Lambeth.*—High-pressure valve cocks; and plumbers', gas fitters', ironmongers', and engineers' furnishings; Carter's patent safety gas valves.

Society of Arts Medal, 1847; *Prize Medal*, 1851; *Bronze Medal, Amsterdam*, 1854.

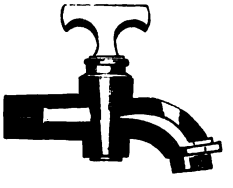


LAMBERT'S EQUILIBRIUM BALL VALVE.

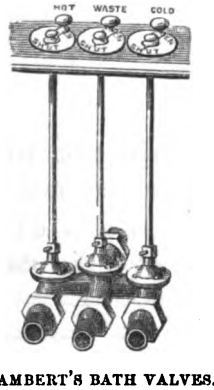
This ball valve is equally adapted for high or low pressure. It runs full bore until the cistern is within two inches of being filled, an important advantage, especially where the supply is intermittent; and it is cheaper than the common ball cock.



LAMBERT'S HIGH-PRESSURE BIB VALVE.



COMMON BIB COCK, CRUTCH KEY.

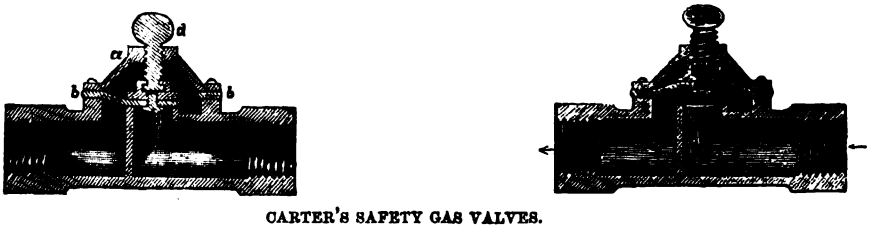


LAMBERT'S BATH VALVES.

VALVE CLOSET WITH LAMBERT'S PATENT REGULATING VALVE COCK, WHICH DELIVERS A GIVEN QUANTITY AT EACH ACTION.

Section of Valve closed.

Section of Valve open.



CARTER'S SAFETY GAS VALVES.

These valve cocks are made to suit every description of fittings, never leak, and never set fast, give great facility for regulating the flow of gas, and are exceedingly durable.

Illustrated catalogues post-free.

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LOYSEL, EDWARD, C.E., 92 *Cannon Street, London, E.C.*—1. Loysel's patent hydrostatic percolator for extracts of vegetable substances, dye-woods, tea, coffee, &c. 2. Loysel's patent keyless locks and padlocks, safes, bags, cash and deed boxes, &c. 3. Loysel's patent portable hot-air ovens, for bread, coffee, potatoes, chestnuts, &c. 4. Loysel's patent reflecto-culinarium for broth.

IN ACTION.

HYDROSTATIC PERCOLATORS.

Obtained the Medal at the Paris Exhibition, 1855.

LOYSEL'S PATENT HYDROSTATIC PERCOLATOR, an apparatus for making infusions, or liquid extracts, of vegetable fibrous substances, such as coffee, tea, dye woods, medicinal herbs, roots, or barks, malt and hops, beet root, &c. is used exclusively at all the refreshment buffets of the International Exhibition, 1862; and was used at all the buffets of the Paris Exhibition, 1855.

Loysel's percolator is the only perfect system for making tea and coffee, either for families or hotels, refreshment rooms, schools, ships, &c. It is used already by upwards of 120,000 families, and at most large establishments in the United Kingdom, such as the buffets of the International Exhibition, the House of Commons, the Clubs (Reform, Conservative, Gresham, &c.), South Kensington Museum, London Tavern, St. James's Hall, Cremorne, Great Western Royal Hotel, Breach's New Palace Hotel, Queen's (Bull and Mouth) Hotel, &c.

Loysel's percolator is manufactured in tin, copper, bronze, britannia, electro-plate, and silver, by seven of the largest and best manufacturers in the United Kingdom, including Messrs. Elkington & Co. It is sold as low as 5*s.* by all respectable ironmongers, silversmiths, &c.

Directions for making coffee and tea:—Warm the percolator with hot water; place the ground coffee or triturated tea on the bottom filter inside the urn; place the movable filter over it. Screw the inverted lid or funnel on the centre pipe, as shown here above, pour into the reservoir so formed the boiling water necessary for the quantity of infusion required. This water will instantaneously go down the centre pipe and percolate upwards through the substance under the powerful action of hydrostatic pressure, and thereby extract at once all the useful and aromatic parts. Then unscrew the lid or funnel, pour back direct into the urn the first cup drawn from the tap; cover the urn, and the infusion will at once percolate downwards through the substance and fill the cup with tea or coffee, all of uniform strength, exquisite aroma, and unrivalled brightness.

London depôts, retail and wholesale: City, 92 Cannon Street, E.C.; and West End, 309 Regent Street, W.

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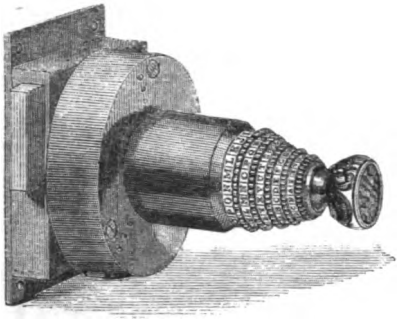
LOYSEL, EDWARD, *continued.*



LOYSEL'S PATENT KEYLESS LOCK.

Properly speaking, the "keyless lock" may be said to be composed of two parts, the hinder part, which is the lock and contains the bolt, and the fore part, which is, if it may be so termed, a scientific fixed key, which is formed of concentric cylinders, each of which is divided at the middle into two parts, and traversed by a spindle, which is to act on the bolt for shutting and opening the lock.

The outer edges or faces of the concentric cylinders are impressed with alphabets of 24 or less letters, and it is only when a pre-determined combination is brought into coincidence, that the spindle can be brought in a position to work the bolt.

It should be observed that, owing to the division of the cylinders into two parts, the owner of a lock can instantly change the combination on which it opens, without pulling the lock to pieces. These changes in the combination may be made from the outside.

There being no key-hole, no instrument whatever can be introduced to try to pick the lock or injure it, and as to introducing gunpowder, it is an utter impossibility; and even if the fore part of the lock, or rather, scientific key, could be broken by extreme violence, the result would be merely to take away all chances of ever opening the lock, as the lock itself, and the hinder part of the key, would remain as an impenetrable block.

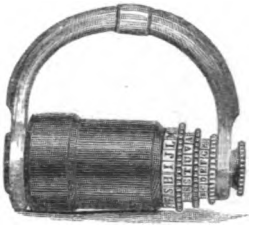
All the parts of the lock being hardened, it is drill proof.

In short, the lock defies violence as well as skill, as there is no possibility whatever of opening it by hearing or feeling, or by any pressure either gentle or rough, as besides the impossibility of bringing the pins opposite the holes, a screening plate has been introduced between the holes and the pins, which renders even trying an utter impossibility. Therefore, the only means of opening this lock is by finding out the combination on which it opens.

Now, a lock with 5 cylinders, of 24 letters each, gives 7,962,624 combinations; ditto 6 cylinders, of 24 letters each, gives 491,102,796 combinations; ditto 7 cylinders, of 24 letters each, gives 4,586,471,424 combinations; and it is calculated that working assiduously 10 hours a day, it would take about 2,000 years for ringing all the changes this last lock is susceptible of.

KEYLESS LOCK FOR BAGS, CASH BOXES, &c.

The keyless lock is made so as to be adapted to travelling bags and cash boxes, and will prove of great convenience, as keys are a great and acknowledged nuisance.



KEYLESS PADLOCK.

Padlocks are also constructed on this principle, which cannot be forced open by pressure, and in which the combination is altered at pleasure without pulling the padlock to pieces, as in the ordinary letter padlocks. The lock will also be adapted to most purposes for which locks in general are used.

As to the cost, it will be, if anything, less than locks of any other system or corresponding quality, as every part is made by machinery, which generally combines precision with cheapness.

The keyless lock, originally the invention of Viscount de Kersolon, who has worked at it for 20 years, has been improved and patented in England, by E. Loysel, C.E. Assoc. Inst. C.E.

London depôts for Loysel's patent keyless locks: City, 92 Cannon Street, E.C.; West End, 309 Regent Street, W.

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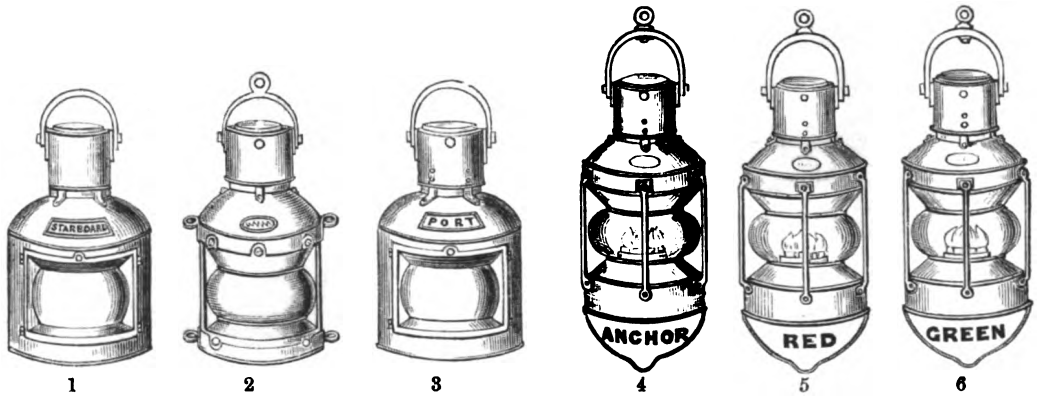
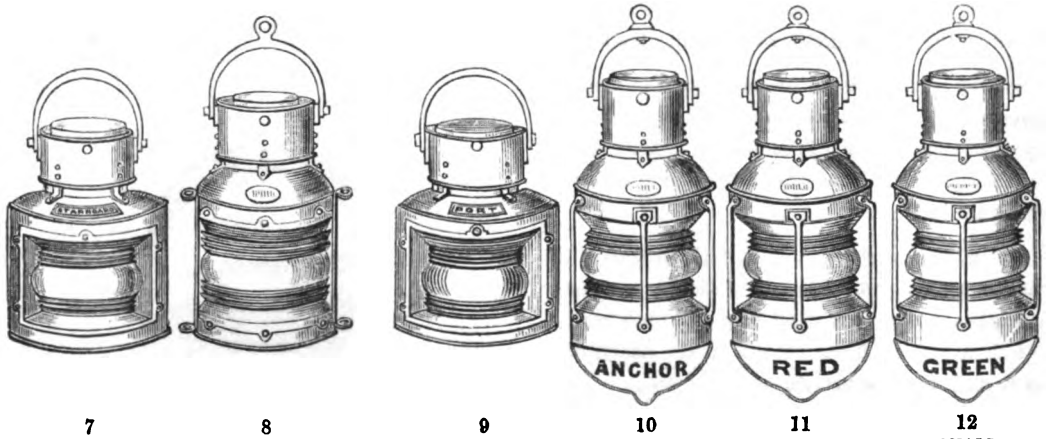
NUNN, WILLIAM, 179 *St. George Street, E.*—Patent signal lanterns, lenses, and reflectors.

By Royal Letters Patent.



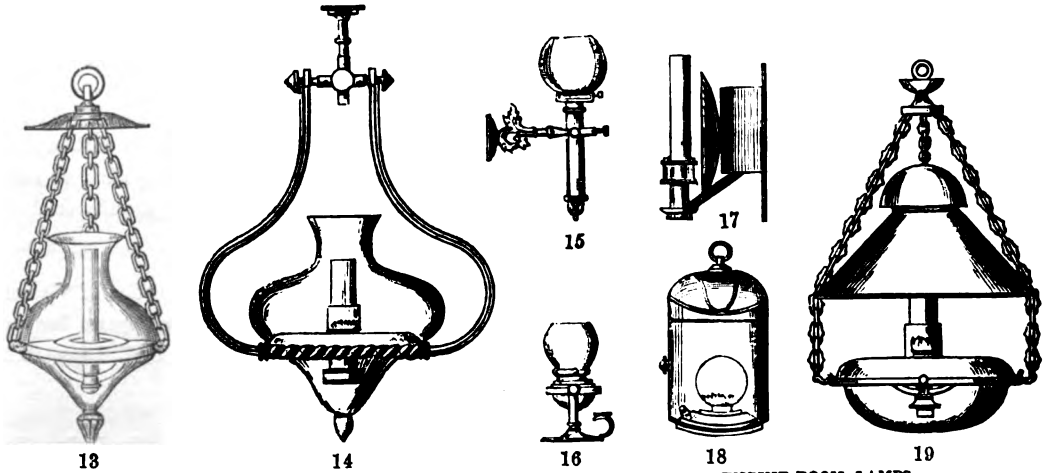
1 STARBOARD. 2 MASTHEAD. 3 PORT. 4 NIGHT SIGNAL. 5 6 STORM WARNING SIGNALS.

The above are fitted with powerful reflecting lenses, tested, approved, and adopted in the Royal Navy, also constructed so that a new lens can be replaced in three minutes by any person on board when the old lens is broken.



7 STARBOARD. 8 MASTHEAD. 9 PORT. 10 NIGHT SIGNAL. 11 12 STORM WARNING SIGNALS.

These lanterns are fitted with patent *dioptric* lenses, also constructed for the refitting of a new lens in the place of one broken in three minutes, and can be made to burn oil or stearine candles, as may be required.



13 14 15 16 17 18 19

SUSPENDING SALOON AND CABIN LAMPS. ENGINE-ROOM LAMPS.

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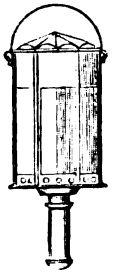
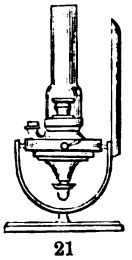
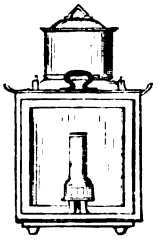
NUNN, WILLIAM, *continued.*



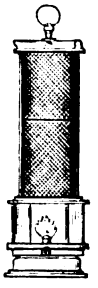
20 FIGHTING LAMP.



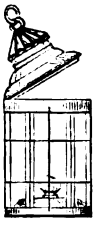
21 MAGAZINE LAMP.



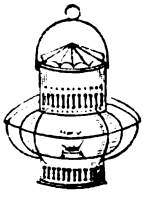
22 BETWEEN-DECK LAMP.



23 MINERS' LAMP.



24 HAND OR HOLD LAMP.



25 GLOBE SAFETY LAMP.

Railway lamps and reflectors, ship and railway lenses in ruby, green, and white.

In forwarding orders for lamps, &c. the tonnage of vessels in which they are to be used should be given.

Some of these lamps and lenses are exhibited in Class XII.

[6333]

OLIVER, GEORGE & JOS., 286 *Wapping, E.*—Dioptric ships' signal lamps and buoy.

[6335]

PHILLP, CHARLES J., 20 *Caroline Street, and* 29 *Mary Street, Birmingham.*—Gaseliers, brackets, and gas fixtures generally.

[6336]

PONTIFEX, HENRY, & SONS, 55 *Shoe Lane, Holborn, London.*—Brewing and distilling apparatus.

[6337]

PONTIFEX, R., & SON, 14 *Upper St. Martin's Lane, London.*—Copper, brass, and steel plates.

[6338]

PROSSER, W., & H. J. STANDLY, 24 *Dorset Place, and* 20 *Cockspur Street.*—Improved lamps for lime lights.

[6339]

PYRKE, J. S., & SONS, *Dorrington Street, London.*—Bronzed tea and coffee urns, and swing kettles.

[6340]

REID, JOHN, *Edinburgh.*—Patent gas-saturator for preventing evaporation of water from gas meters.

[6341]

RENNIE & ADCOCK, *Easy Row Works, Birmingham.*—Chandeliers, candelabra, bronzes, mirrors, and works of art.

[6342]

RICHARDS, W., *Crawford Passage, Clerkenwell.*—Models of gas meters in progress of making.

1. An ordinary gasholder, converted into a gas measure.
2. Gasholder, as constructed by Mr. Clegg, supposed to have suggested the present meter.
3. An ordinary gas meter wheel, revolving in its case.
4. A wet gas meter as constructed by exhibitor, and patented by him in 1858.
5. A transverse section of a wet gas meter as constructed by exhibitor.
6. Section of a gas meter wheel as constructed by exhibitor.
7. Clegg's inferential dry gas meter.
8. Meter made by Dry Meter Company, in 1835-6.
9. Meter patented by G. Sullivan, 1837.
10. Meter patented by N. Defries and N. F. Taylor, 1843.
11. Dry meter invented and manufactured by exhibitor in 1844.
12. Dry meter invented by the exhibitor, and now manufactured by him.
13. Lowe's motive power meter.
14. An exhaust and pressure tell-tale indicator.

[6343]

SARSON, THOMAS FREDERIC, *Leicester.*—Lamp upon a new construction, that can be repaired in a few minutes.

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[6344]

SINGER, JOHN W., *Frome, Somerset.*—Brass lectern, altar rails, and mediæval ornaments.

[6345]

SKIDMORE ART MANUFACTURES COMPANY, THE, *Great Coventry.*—Screens for Hereford, Ely and Lichfield cathedrals; gas corona, pendants, standards, &c.

[6346]

SOUTTER, WILLIAM, *New Market Street, Birmingham.*—Tea-urns and kettles.

The following goods, suitable for the home and export trades, are exhibited :—

1. COPPER BRONZE TEA URNS, showing the early designs.
2. COPPER BRONZE TEA URNS, most modern designs, showing the various modes of heating by spirits of wine, iron heater, and charcoal.
3. COPPER BRONZE SWING KETTLE, used for same purpose as the urn, showing latest improvements in spirit lamp.
4. BRASS URN OR SAMAVOIR, as used in Russia, heated by charcoal.
5. BRASS COFFEE URN AND BASIN, as used in Turkey, heated by charcoal.
6. BRASS DUTCH TEA URN, heated by charcoal.
7. BRASS TRAY, used in Turkey.
8. COPPER BOX IRON, heated by charcoal; used in the cape trade for ironing purposes; two patterns, showing the latest improvements.
9. LARGE COPPER SOUP OR STOCK POT, raised from the sheet metal without seam, by an entirely new process.
10. Assortment of COPPER COOKING UTENSILS.

[6347]

STEER, JOSEPH, 44 *Weaman Street, Birmingham.*—Cornices, cornice poles, ends, rings, brackets, and curtain bands.

[6348]

STONE, JOSIAH, *Deptford, London, S.E.*—Copper and cast composition boat and ship nails, &c.

[6349]

STRODE, WILLIAM, 16 *St. Martin's-le-Grand, London, E.C.*—Improved sun burner, with valve, and a bronze valve candelabra.

[6350]

SUGG, W., *Marsham Street, Westminster.*—Gas meters; governors and pressure gauges; lava burners; and public lamp governors.

[6351]

TAYLOR, JOHN, & Co., *Loughborough.*—A large bell, three tons weight, note B, suspended on frame, with hammer for striking.

Obtained the Prize Medal, Great Exhibition, 1851, and the special approbation of the jurors.

[6352]

THOMASON, THOMAS, & Co., 30 *St. Paul's Square, Birmingham.*—Ecclesiastical and domestic Gothic metal work.

[6353]

TILLMAN, GEORGE, 5 *Ashley Crescent, City Road.*—Carriage lamps.

[6354]

TONKS, WILLIAM, & SONS, *Moseley Street, Birmingham.*—Brass work for builders, cabinet-makers, and upholsterers.

Obtained Medals at the Exhibitions of London, 1851, and Paris, 1855.

Hinges, bolts, sash, casement, and espagniolette fasteners, knobs, handles, door porters and knockers, brackets, shop-window fittings, organ, pew, and desk railings, mouldings, sideboard edgings, picture and stair rods, bell pulls and levers, upright and mantel-piece screens, sconces, candlesticks, ventilators, &c.

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[6355]

UNDERHAY, F. G., *Crawford Passage, Clerkenwell, London, E.C.*—Patent direct-action compensating gas meter.

[6356]

VERITY, B., & SONS, 31 & 32 *King Street, Covent Garden.*—Gaseliers and brass works.

The following chandeliers are exhibited :—

1. LARGE EIGHT-LIGHT GASELIER, designed by the late John Thomas. Price £95 0
2. EIGHT-LIGHT POLISHED GASELIER (Old English). Price £30 0
3. FIVE-LIGHT GASELIER, in bronze (Grecian design). Price £12 12
4. ORIENTAL HALL LAMP, designed by George Somers Clarke. Price £28 0
5. FIVE-LIGHT GASELIER, designed by the late John Thomas. Price £21 0
6. TAZZA GASELIER, for three lights, suitable for a boudoir. Price £3 10

And several other gaseliers, all new designs, suitable for drawing and other rooms.

A great variety of designs for bracket-lights, standards, and vases, all for gas, are likewise exhibited in their case.

VERITY & SONS manufacture and fit gas baths, and gas and hot-water apparatus. They make gaseliers and every kind of brass work to any design required, and erect private gas works. A working model of one of the latter is exhibited at the factory.

A large assortment of gaseliers, brackets, &c. of their own manufacture is always kept in stock at their show-rooms. Factory, Hart Street, Covent Garden ; West End branch, Charles Street, Westbourne Terrace.

[6358]

WARNER, JOHN, & SONS, *Crescent, Cripplegate, London.*—Bells, urns, baths, lamps, braziery, weights, and measures. (*See pages* 128 *to* 132.)

[6359]

WEST & GREGSON, *Oldham.*—Model gas (station) meter, with its appurtenances.

[6360]

WOOTTON & POWELL, *Parade Works, Birmingham.*—Gas chandeliers and wall brackets.

[6361]

WYATT, ALFRED, 22 *Gerrard Street, Soho, W.*—Silver-plated state carriage lamps.

[6362]

YOUNG, JOHN, & SON, 46 *Cranbourn Street, London.*—Weighing machines, with multiplying power, for persons or goods.

[6363]

CARTER & HACKS, *West Middlesex Waterworks, Kensington Reservoir.*—Screw cocks, with and without packing, under pressure.

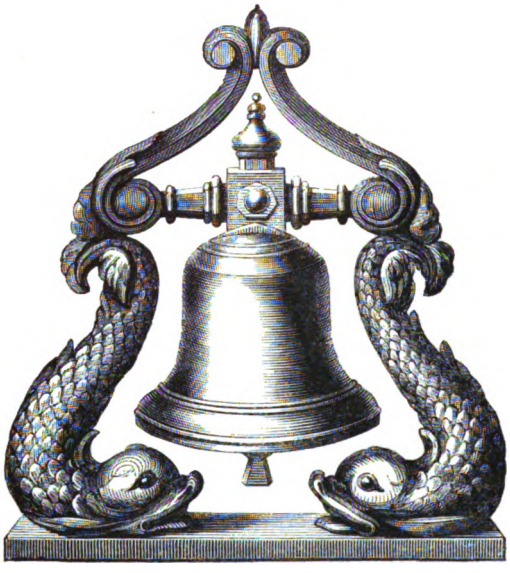
[6364]

RICKETS & HAMMOND, *Agar Street, Strand.*—Globe-light chandeliers, and ventilating globe lights.

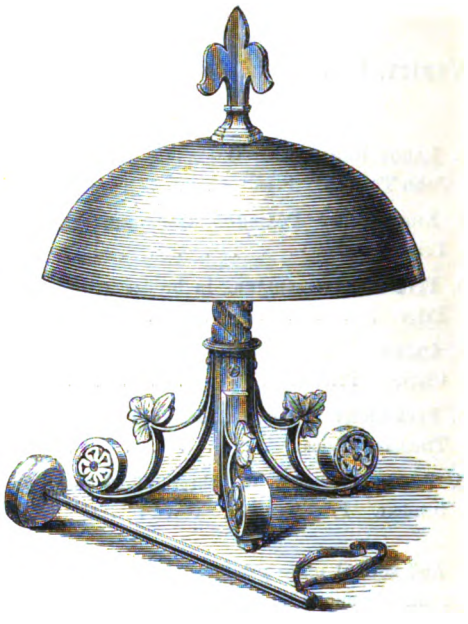
Digitized by Google

WARNER, JOHN, & SONS, *Crescent, Cripplegate, London.*—Bells, urns, baths, lamps, braziery weights and measures.

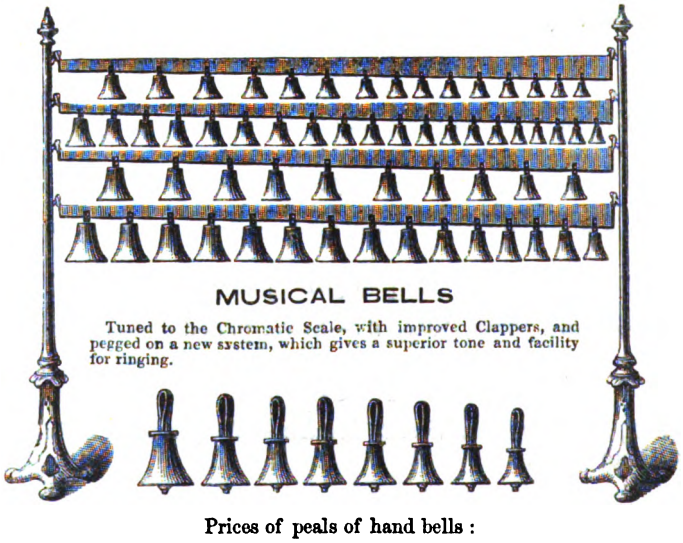
Prize Medal awarded 1851, *for bells.*



No. 8. A 12-IN. TURNED AND POLISHED SHIP'S BELL, in bronzed cast-iron dolphin frame.
Other sized bells can be had when required.



No. 9. A GONG, OR CALL BELL, forming an appropriate ornament for the halls of mansions.


MUSICAL BELLS
Tuned to the Chromatic Scale, with improved Clappers, and pegged on a new system, which gives a superior tone and facility for ringing.

Prices of peals of hand bells :

	A peal of 15.	A peal of 12.	A peal of 10.	A peal of 8.
No. 22 size, in C	£8 10 0	£7 14 0	£7 0 0	£6 7 0
No. 21 ditto D	7 9 0	7 0 0	6 7 0	5 16 0
No. 20 ditto E	7 0 0	6 2 0	5 16 0	5 9 0
No. 19 ditto F	6 7 0	5 16 0	5 12 0	5 6 0
No. 18 ditto G	5 16 0	5 6 0	4 14 0	5 0 0
No. 17 ditto A	5 12 0	4 19 0	4 11 0	4 5 0
No. 16 ditto B	5 6 0	4 14 0	4 7 0	3 19 0
No. 15 ditto C	5 0 0	4 11 0	4 5 0	3 17 0

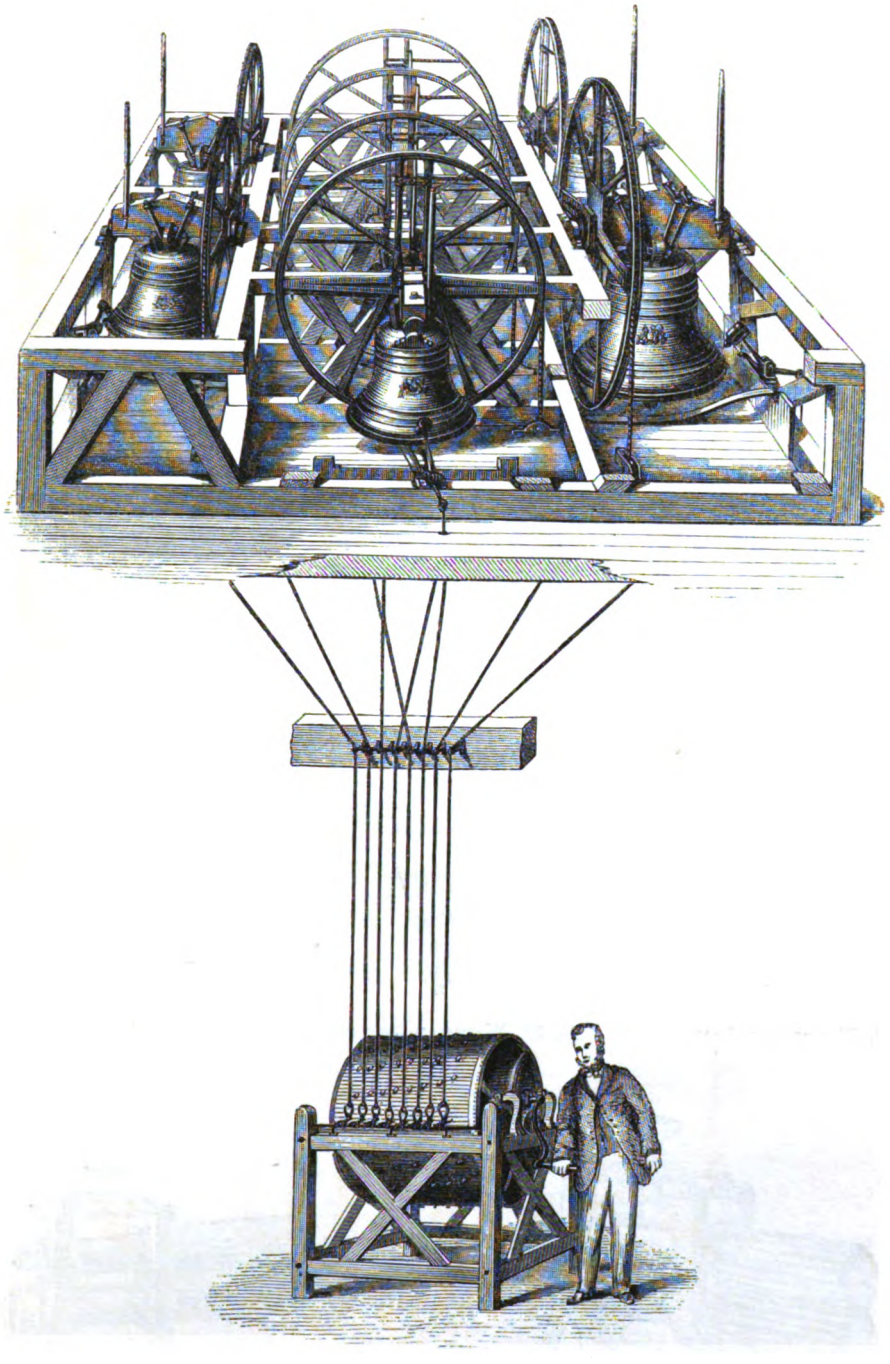
An extensive stock kept of—

House bells; ditto, turned and lacquered; ditto, with springs for shutters; bells for ships, yachts, steamers, &c.; horse bells; sheep bells; dog bells; clang bells for cattle; ferret bells; squirrel bells; dinner bells; tea bells; bellman's bells; self-acting alarm bells; small clock bells.

Digitized by Google

WARNER, JOHN, & SONS, *continued.*

Obtained a Prize Medal in 1851.



PEAL OF EIGHT BELLS.

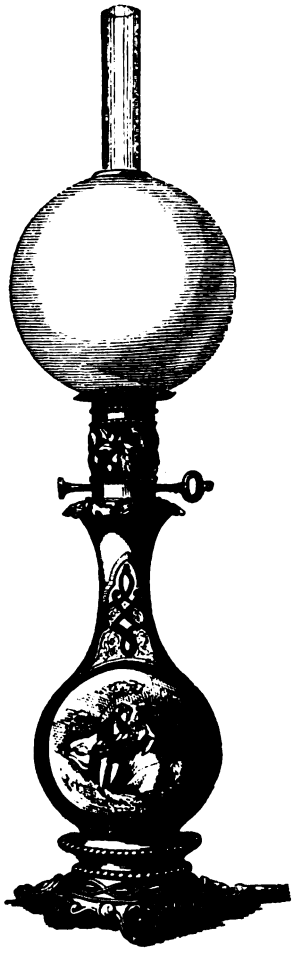
Drawing showing a peal of eight bells fixed in a frame for ringing. In connexion with it, is shown one of J. Warner & Sons' IMPROVED CHIMING MACHINES, by which a lad entirely unaccustomed to music may correctly chime a whole peal. In parts of the country where no good ringers are to be obtained, this simple machine will be found invaluable. John Warner & Sons continue to supply estimates for bells of all sizes, singly or in peals, as well as for recasting broken or bad bells, new oak frames and fittings, and contract to hang bells.

The original Big Ben, the largest bell ever cast in England, the present quarter bells in the clock tower of the Houses of Parliament, the bells at Her Majesty's palace at Balmoral, the hour bell at the Leeds Town Hall, the peal of eight at Doncaster Cathedral, and the bells exhibited in connexion with Mr. Dent's large clock, were cast by John Warner & Sons.

Digitized by Google

WARNER, JOHN, & SONS, *continued.*

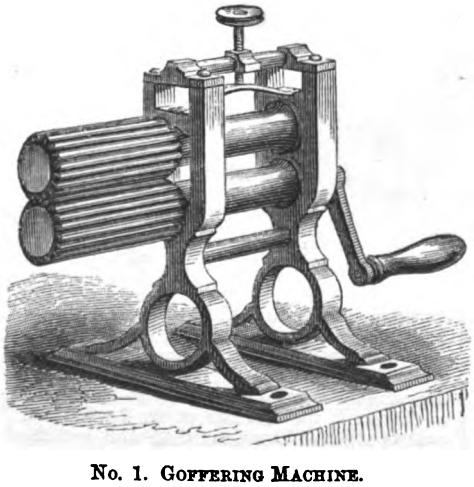
Obtained a Prize Medal in 1851.



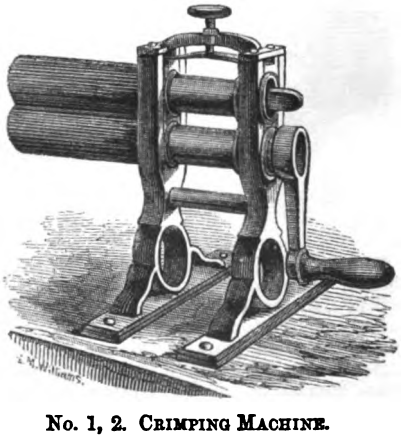
No. 56. MODERATOR LAMP.

No. 87. WARWICK GRECIAN LAMP.

No. 196. CRESCENT OIL LAMP



No. 1. GOFFERING MACHINE.



No. 1, 2. CRIMPING MACHINE.

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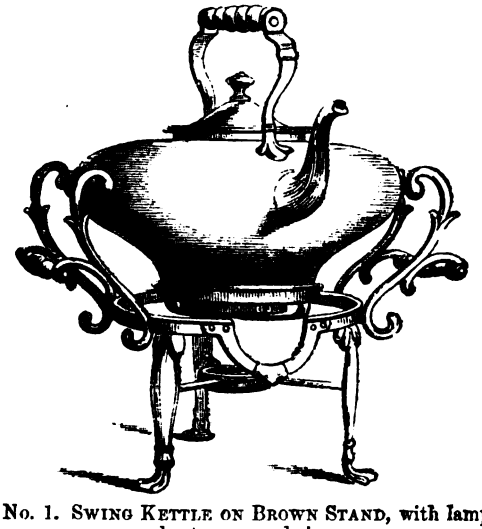
WARNER, JOHN, & SONS, *continued.*

Obtained the Prize Medal in 1851.

No 296. A 4-QUART URN.

No. 297. A 5-QUART URN.



No. 1. SWING KETTLE ON BROWN STAND, with lamp or heater, several sizes.

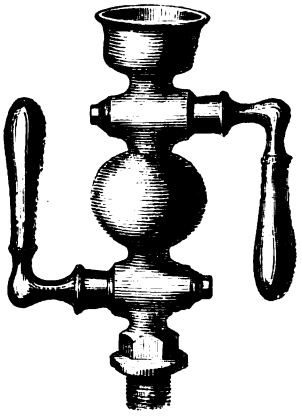
No. 3. SWING KETTLE ON BLACK STAND, with lamp or heater, several sizes.

Urns and kettles of various patterns, and every variety of braziery goods, kept in stock.

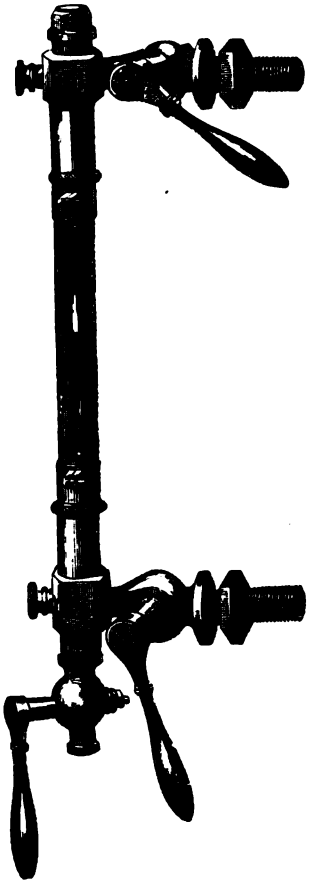
Digitized by Google

WARNER, JOHN, & SONS, *continued.*

Obtained the Prize Medal in 1851.



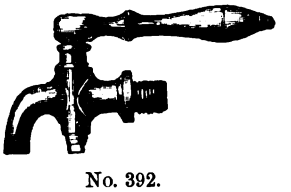
No. 408½.



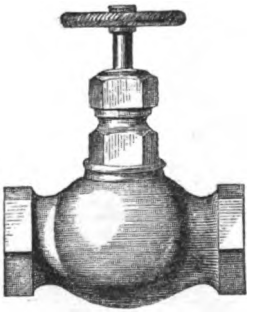
No. 390.

No. 404.

No. 408.

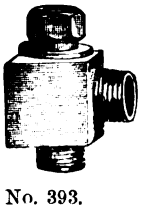


No. 392.

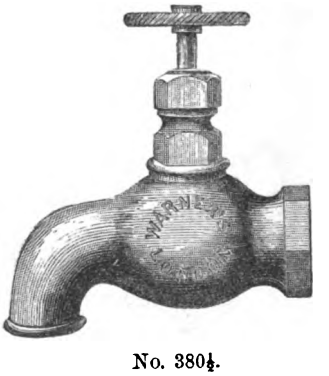


No. 380.

No. 398.



No. 393.



No. 380½.

GUN-METAL STEAM GAUGE WORK, for portable or fixed engines :—
No. 408½. GUN-METAL DOUBLE GREASE COCK.
No. 390. GUN-METAL WATER GAUGE.
No. 404. GUN-METAL STEAM WHISTLE, of all sizes.
No. 408. GUN-METAL GREASE COCK.
No. 392. GUN-METAL FULLWAY GAUGE COCK.
No. 398. GUN-METAL SYPHON OIL CUP.
No. 393. GUN-METAL VALVE BOX.
No. 380. GUN-METAL VALVE, for steam, water, or gas.
No. 380½. CAST-IRON VALVE, for steam, water, or gas.

Illustrated and priced catalogues can be had on application.

Digitized by Google

SUB-CLASS C.—*Manufactures in Tin, Lead, Zinc, Pewter, and General Braziery.*

[6373]

AZULAY, BONDY, *Rotherhithe, Surrey.*—Heat-retaining vessels for boiling-water, &c.

[6374]

BEARD & DENT, 21 *Newcastle Street, Strand.*—Plumbers' appliances.

[6375]

BRABY, FREDERICK, & Co., *Fitzroy Works, Euston Road, London.*—Galvanized zinc ; galvanized iron ; roofing felt ; perforated metals. (*See page* 134.)

[6376]

CHATTERTON, JOHN, *Wharf Road, City Road, London.*—Specimens of lead, block tin, and composition pipe.

Specimens of improved lead pipe, pure block-tin pipe, composition gas-tube, and also of lead pipe, coated internally with tin, and the patent compound tube, or lead pipe, lined with gutta percha, for use in localities where water acts upon lead.

[6377]

COOKSEY, HECTOR RICHARD, 148 *Bordesley, Birmingham.*—Coffin plates, handles, and ornaments.

[6378]

DIXON, JAMES, & SONS, *Sheffield.*—Britannia metal wares.

[6379]

ELLIS, JOSEPH, 136 *King's Road, Brighton.*—The Elutriator, for decanting wine or other liquids successfully, but without additional care or trouble.

[6380]

EWART, HENRIETTA, 346 *Euston Road, N.W.*—Baths, washstands, flower-boxes, meat-safes, spirometer, flues, mouldings, and other zinc goods. (*See page* 136.)

[6381]

FOXALL, SAMUEL, 52 *William Street, Regent's Park, N.W.*—Confectioners' moulds, piecer, &c.

[6382]

GILBERT, JOHN A., & Co., *Clerkenwell, London.*—Mills, scales, canisters, and shop fittings used by grocers.

[6383]

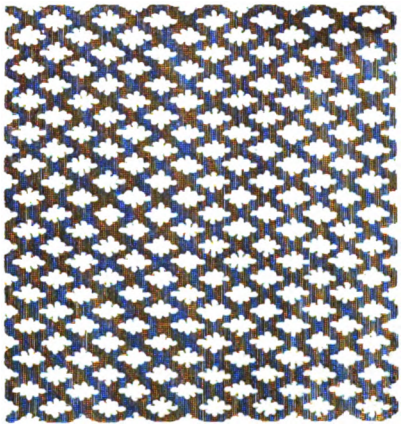
HICKMAN & CLIVE, *William Street North, Birmingham.*—Coffin furniture.

[6384]

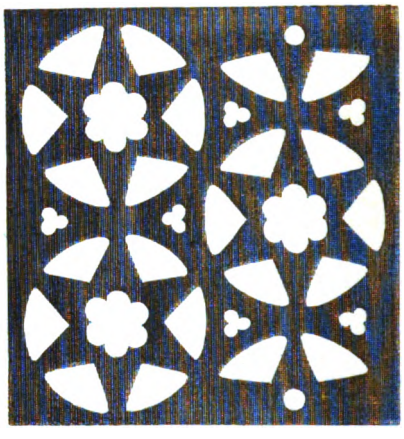
LOVEGROVE, JOHN JAMES, 6 *Pembroke Place, Spring Grove, Isleworth, Middlesex.*—Specimens of plumbing, from 14th century to present time.

Digitized by Google

BRABY, FREDERICK, & CO., *Fitzroy Works, Euston Road, London.*—Zinc; galvanized iron; roofing felt; perforated metals.



PERFORATED ZINC. No. 12 B.



PERFORATED ZINC. No. 25.

Perforated zinc in various designs and sizes of holes, for ventilations, sieves, window blinds, larders, meat safes, dairy windows, &c.

Zinc friezes and frets for verandahs, lamps, and decorative purposes.

Zinc saws for cutting salt.

Sheet zinc, and zinc nails.

Zinc tubing for bell hanging.

A zinc meat safe.

A perforated zinc window blind.

Pierced tin plates and percolators.

Perforated galvanized iron.

Stabbed iron for malt-kiln plates.

ROOFING FELT, 1*d.* per square ft.

Corrugated galvanized iron for roofing.

Malleable galvanized iron sheets of superb quality.

Wire netting, galvanized and japanned.

Galvanized iron coal-scoops, buckets and basins, turnip skeps, oval pans, &c.

Galvanized iron furnace pans, or wash boilers.

Portable folding galvanized wire garden-stools, 4*s.* 6*d.* each.

Ditto, chairs, 7*s.* 6*d.* each.

Patent top for curing smoky chimneys.

GALVANIZED IRON PAIL.

Galvanized iron basins for use of schools.

Perforated card-board and cards, fancy.

Zinc mouldings, flower baskets, stands, &c.

Spelter for brass-founders.

Digitized by Google

[6385]

LOVERIDGE, HENRY, & CO., *Wolverhampton.*—Papier-maché trays, wares, &c.

Beart & Platow's coffee pots and urns, of which Messrs. Loveridge & Co. are the patentees and manufacturers.

Dish covers.

Victoria Regia sponge and patent hip-baths.

Patent hip-bath with jointed covers.

The patent folding roasting-jack screen.

Patent Persian coal-scoops.

Albert and Windsor coal-scoops, and coal vases of every description.

Iron and patent paper and fine papier-maché tea-trays.

COAL VASE—ELIZABETHAN STYLE.

The coal vase here represented will be found in the Wolverhampton Court.

This vase is a composition after the Elizabethan period, designed by Remmett, and is the first instance with which we are acquainted of a successful union of a bright metallic surface (silver-plated or ormolu) with japanned ware.

The metal handles and pillars may be taken off for repairs and cleaning.

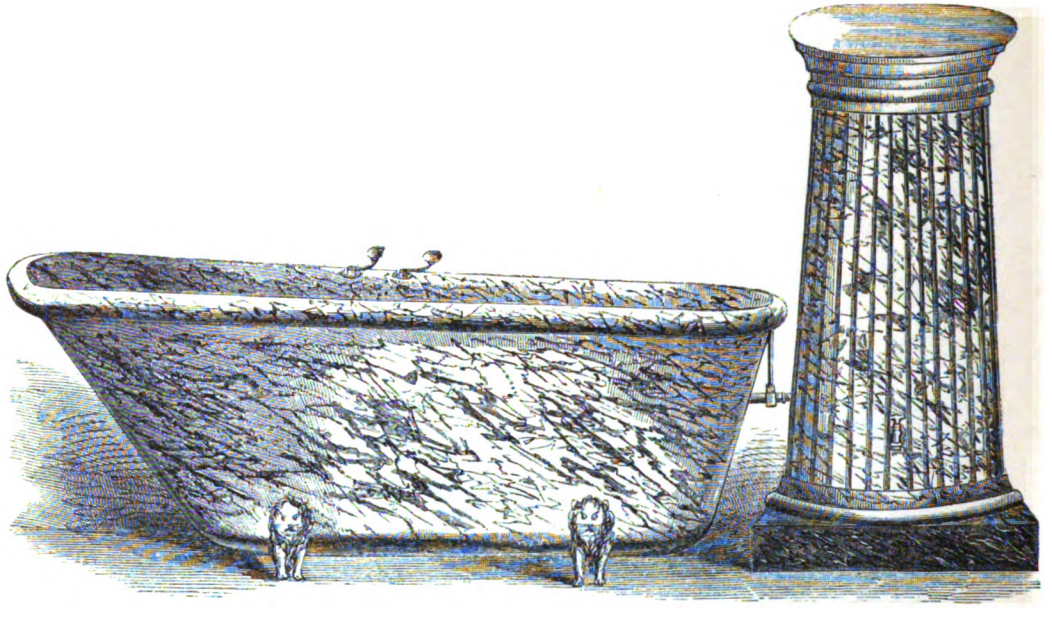
The plating is protected by a white lacquer from the effects of the atmosphere.

The objection to silver-plating, viz. its liability to tarnish, is thus entirely obviated.

This vase may be fitted up as a Canterbury, a cellarette, or with a loose lining as a coal vase; it was for the last purpose more particularly designed.

Digitized by Google

EWART, HENRIETTA, 346 *Euston Road, N.W.*—Baths, washstands, flower-boxes, meat-safe, spirometer, flues, mouldings, and other zinc goods.

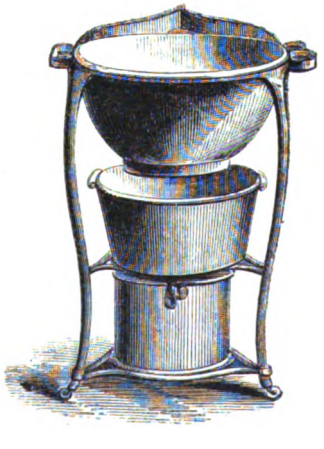


ROMAN BATH.

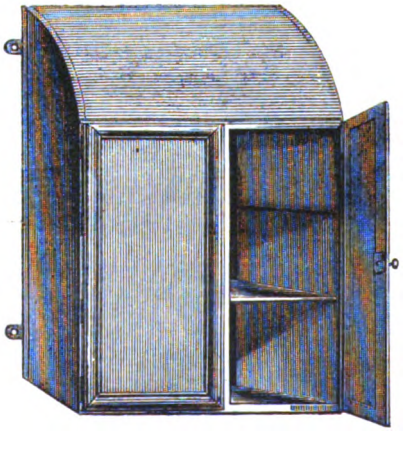
1. ROMAN BATH, with a new arrangement for a supply of hot water. Can be adapted for either gas or coke, and does not require any fire-place in the bath-room. It is also so constructed that hot water can be drawn off for cleaning or other purposes, as well as for the bath. The same system of heating can be applied to all kinds of baths, and will be found speedy and economical.

Price, complete, including cocks, levers, and handles £12 12

Baths of a less costly description with the same arrangement, from £8 8



DEEP WASH-HAND BASIN.



ZINC MEAT SAFE.

2. DEEP WASH-HAND BASIN, for gentlemen, 24 in. diameter, 12 in. deep, on stand 3 ft. high, with castors. The basin is provided with a plug, by means of which it can be emptied, after use, into the bath beneath without removing either.

Price, including the water can, which contains about 4 gallons £2 15

The same pattern can be made any size, or japanned any colour, at proportionate prices.

3. SPIROMETER, an instrument made of zinc, for testing the capacity of the lungs. Price £3 10

4. ZINC MEAT SAFE, with hollow shelf, which can be filled with warm water in winter, and with ice in summer. Price £4 4

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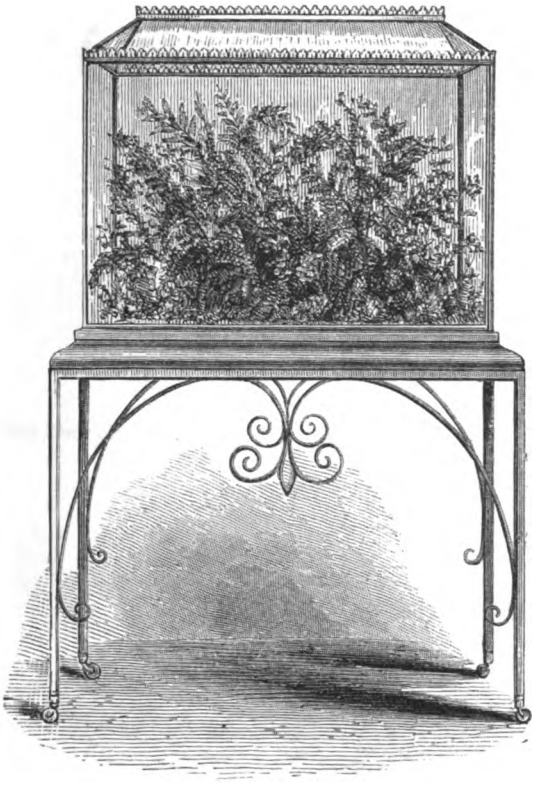
EWART, HENRIETTA, *continued.*



FERN CASE ON STAND.

5. FERN CASE on stand, with sliding door at each end. Price, complete £3 3

6. MODELS OF FLUES, COWLS, and various contrivances made of zinc, for curing smoky chimneys and preventing down-draughts.

7. Specimens of zinc mouldings, rain-water pipes, gutters, and heads.

8. Specimens of zinc sash-bars, tubes, astragles, &c.

9. FLOWER BOX for windows, made of zinc, mounted with tiles. Size, 8 in. by 8 in. Price 4*s.* 6*d.* per ft.

10. FLOWER BOX for windows, made of zinc, mounted with tiles. Size, 10 in. by 10 in. With mouldings, price 6*s.* 6*d.* per foot.

11. FLOWER BOX for balconies, all of zinc. Size, 11 in. by 12 in. Price 5*s.* 6*d.* to 7*s.* 6*d.* per ft.

[6386]

MARSTON, JOHN, *London Works, Bilston, Staffordshire.*—Trays, waiters, coal vases, toilette ware, and other japanned goods.

[6387]

PERRY, EDWARD, *Jeddo Works, Wolverhampton.*—Japan and tin wares.

[6388]

TYLOR, J., & SONS, *Warwick Lane, Newgate Street, E.C.*—Baths for private dwellings. (*See page* 138.)

[6390]

WATTS & HARTON, 61 *Shoe Lane, Holborn Hill.*—Pewter articles of every description.

[6391]

WILSON, R. & W., *London.*—Baths, various, and pedestal rotary plate warmer.

[6392]

WOLVERHAMPTON ELECTRO-PLATE COMPANY, THE, *Peel Works, Wolverhampton.*—Silver-plated wares, tea and coffee services, &c. (*See page* 139.)

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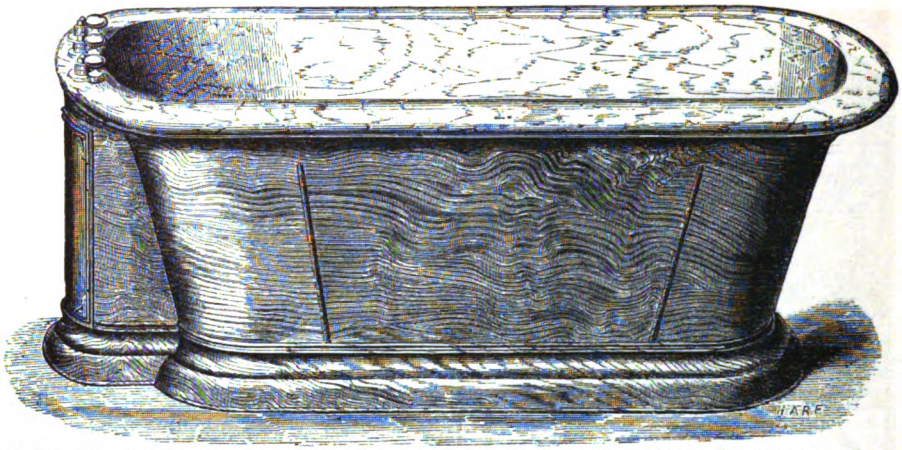
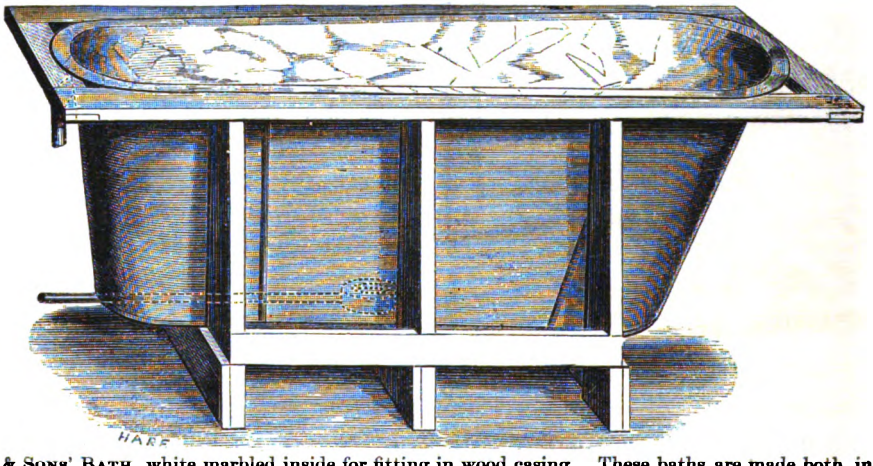
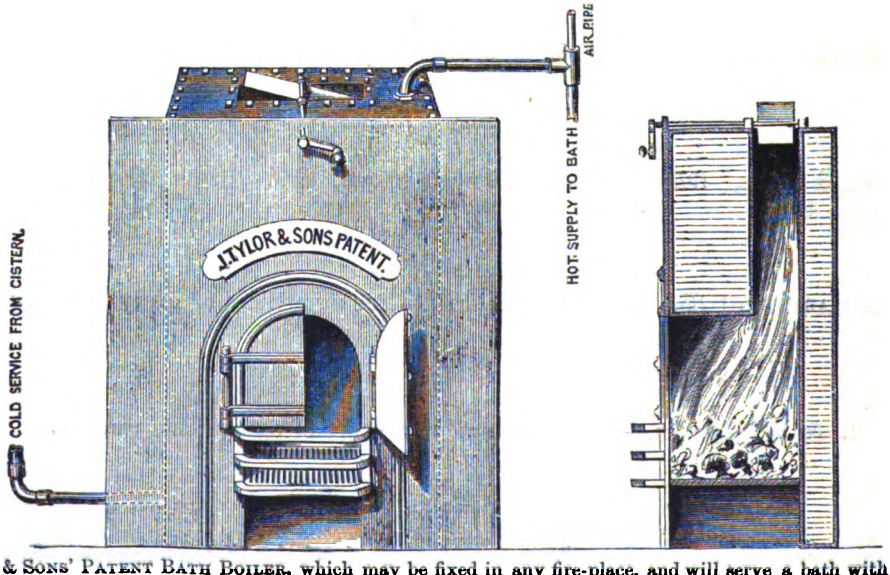
TYLOR, J., & SONS, *Warwick Lane, Newgate Street, London, E.C.*—Baths for private dwellings.



J. TYLOR & SONS' PATENT BATH, sienna marbled inside, verdantique outside. Taps and safe fitted. No wood casing required.



J. TYLOR & SONS' BATH, white marbled inside for fitting in wood casing. These baths are made both in copper and galvanized tinned iron, 5 ft. to 5 ft. 6 in. long.



J. TYLOR & SONS' PATENT BATH BOILER, which may be fixed in any fire-place, and will serve a bath with hot water in any apartment below the level of the cold-water cistern.
Catalogues containing illustrations of nine methods of fixing a warm bath, on application.

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WOLVERHAMPTON ELECTRO-PLATE COMPANY, THE, *Peel Works, Wolverhampton.*—Silver-plated wares, tea and coffee services, cruet frames, spoons, forks, &c. &c.

BREAKFAST OR DINNER CRUET, also made as an inkstand—Neptune driving through the sea. No. 1226.

[6393]

ZOBEL, JULIUS, 139 *Euston Road.*—Geometrical works; flower ornaments for gas and water, &c.

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CLASS XXXII.

STEEL CUTLERY AND EDGE TOOLS.

SUB-CLASS A.—*Steel Manufactures.*

[6425]

ACADIAN CHARCOAL IRON COMPANY (Limited), 17 *New Church Street, Sheffield.*—Pig and bar iron, steel, and steel tools and cutlery.

[6426]

ALLCOCK, SAMUEL, & CO., *Unicorn Works, Redditch, and* 121 *King Street, Toronto.*—Needles, fish hooks, and fishing tackle.

[6427]

BESSEMER & LONGSDON, 4 *Queen Street Place, New Cannon Street.*—Various specimens of Bessemer iron and steel. (*See page* 142.)

[6428]

BOULTON, WILLIAM, & SON, *Redditch.*—Needles for plain and ornamental work, fish-hooks for sea and river.

[6429]

BRANDAUER, C., & Co., 407 *New John Street West.*—Steel pens and pen holders.

[6430]

BROWN, J., & Co., *Atlas Steel and Iron Works, Sheffield.*—Cast-steel rails, bent and twisted cold.

[6431]

CALDWELL, BROTHERS, 15 *Waterloo Place, Edinburgh.*—Serpentine pen, overcomes greasiness of paper, marks easily, quill-like, and durable.

[6432]

CAMMELL, CHARLES, & Co., *Cyclop Works, Sheffield.*—Iron, steel, files, springs, forgings, railway materials.

[6433]

DEWSNAP, J., 10 *St. Thomas Street, Sheffield.*—Leather and cabinet goods, dressing cases, &c.

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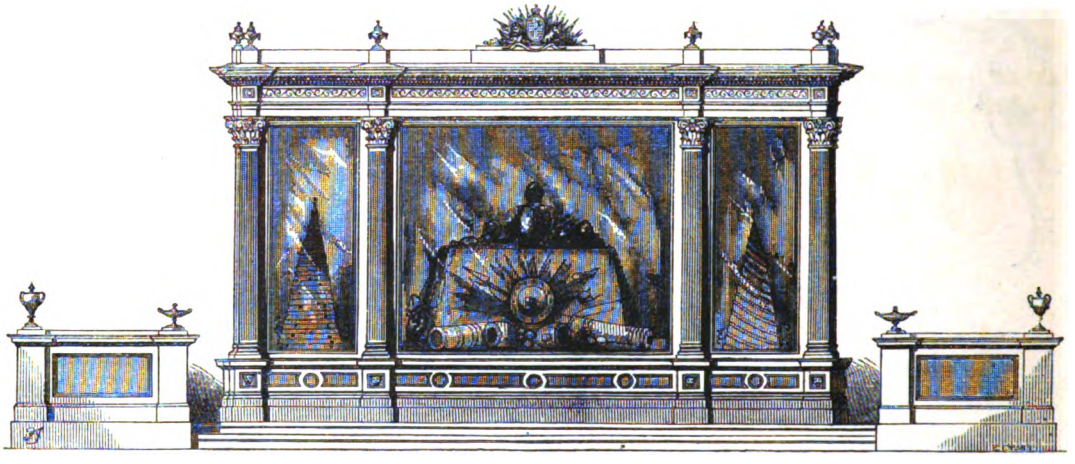
BESSEMER & LONGSDON, 4 *Queen Street Place, New Cannon Street.*—Various specimens of Bessemer iron and steel.



SPECIMENS OF STEEL, ILLUSTRATIVE OF ITS APPLICATION TO VARIOUS PURPOSES.

The whole of the cast-steel employed in the manufacture of the various specimens exhibited was made by the Bessemer process, at the Works of Messrs. Henry Bessemer and Co. Sheffield, with the exception of the locomotive engine tyres, which were made by the same process direct from the fluid iron as it leaves the blast furnace, by M. F. Göranson, of Gefle, Sweden.

Cast-steel is a material possessing greater strength and elasticity than any other known metal, while its power to resist wear and abrasion, and its perfectly homogeneous character, render it greatly superior to wrought-iron for nearly every purpose to which that metal is now applied.

The cost of cast-steel as ordinarily made by melting blister steel or puddled steel in crucibles, is so great as to have hitherto confined its use within very narrow limits, although enough has been done to show its great superiority over wrought-iron.

All the cast-steel made in this country, as well as that made in France and Prussia, has after its original conversion into steel by a series of laborious and expensive processes, still to be melted in clay crucibles in quantities varying from 40 to 50 lbs. in weight, and thus it is only by the simultaneous fusion of hundreds of such crucibles of steel, and the skilful organization of a numerous staff of workmen, that the molten steel can be rapidly collected and conveyed from the numerous furnaces employed for its fusion, and be poured from the separate crucibles in an unbroken stream into the mould.

The Bessemer process, instead of requiring blister steel or puddled steel as the raw material or basis of its manufacture, operates at once upon molten pig-iron, and thus entirely dispenses with the whole of the engine power, skilled labour, and fuel expended in the several processes now employed in making blister steel or puddled steel.

The Bessemer process produces from the crude molten pig-iron in a single vessel, several tons of cast-steel in a period of 20 or 25 minutes, wholly without the employment of skilled labour or any species of manipulation, or the expenditure of any fuel.

The great changes wrought in the character and properties of the crude metal in this short interval, is simply the result of forcing numerous streams of air upwards through the fluid metal, whereby the oxygen contained in the atmosphere is brought in contact with the excess of carbon present in pig-iron, producing an intense combustion and an increase of heat beyond that which has ever been obtained in furnaces employing fuel. The perfect malleability of the metal so produced, will be at once perceived by an examination of the various specimens exhibited, many of which have been bent or twisted cold, in order to show the extreme toughness of the metal, and to what extent it will suffer a change of form without fracture.

The more prominent advantages of the Bessemer process may be briefly stated as follows :—

Masses of tough cast-steel from 10 to 30 or more tons in weight, can be made in half an hour from molten pig-iron.

Large marine engine cranks, shafts, ship's plates, rifled ordnance beams, and other massive parts of machinery, may be made in one piece of cast-steel, without weld or joint.

The tensile strength of this steel varies with the degree of carburation, and ranges between 40 and 70 tons per square inch, the tough qualities most suitable for engineering purposes being about 40 to 48 tons as against 21 tons for common wrought-iron, and 26 tons for the celebrated irons of Yorkshire.

The Bessemer steel is produced in a perfectly fluid state, and admits of being cast into various forms, such as heavy spur wheels, metal rolls, guns, mortars, projectiles, screw propellers, railway wheels, marine and other engine framing, hammer blocks, &c.

The apparatus now employed in the manufacture of Bessemer steel, is rendered almost self-acting under the control of one directing hand, who applies hydraulic force to effect every movement.

The cost of the complete apparatus for carrying on this process, including steam and blast engines, is considerably less than the mere furnaces required to melt an equal quantity of blister or puddled steel.

Apparatus for carrying out the new process on an extensive scale, is now in course of erection in different parts of England, in Scotland, France, Belgium, Prussia, Sweden, and the East Indies.

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[6434]

GILLOTT, JOSEPH, *London and Birmingham.*—Specimens of metallic pens and penholders.

[6435]

GOODMAN, GEORGE, 82 *Caroline Street, Birmingham.*—Patent elastic pins and needles.

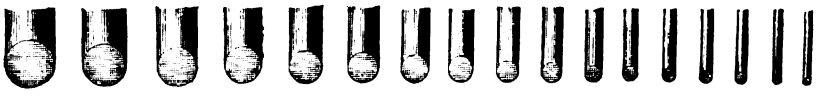
[6436]

HADFIELD & SHIPMAN, *Attercliffe Steel Wire Mills, Sheffield.*—Steel wire for crinoline umbrella ribs, ropes, fish-hooks, springs, &c.

CAST-STEEL WIRE IN RINGS, IRON WIRE SIZES.

CAST-STEEL WIRE IN RINGS, IRON WIRE SIZES.

NEEDLE WIRE SIZES.



ROPE WIRE SIZES.

Hadfield & Shipman are general merchants and manufacturers of crinoline, hardened and tempered, and all sorts of cast-steel wire for needles, pins, fish-hooks, hackle pins, spiral springs, watch springs, &c.; also hardened and tempered cast-steel wire for parasol and umbrella ribs; ropes for deep pits, telegraphs, cables, &c.

[6437]

HINKS, WELLS, & Co., *Birmingham.*—Steel pens and penholders.

[6438]

HOEY, THOMAS, & Co., 25 *New Row West, Dublin.*—Pins and hair pins.

[6439]

HUTCHINSON, P., & SON, *Kendal.*—Fish hooks and fishing tackle.

[6440]

KIRBY, BEARD, & Co., 62 *Cannon Street West, E.C.*—Pins, needles, fish hooks, sewing cotton, and general warehousemen, &c. (*See page* 144.)

[6441]

KNIGHTS, WILLIAM, & Co., *Shaksperean Works, Stratford-on-Avon.*—Needles and mourning hatbands.

These drilled and egg-eyed needles are among the best that are manufactured. They possess the combined advantages of a brilliant polish, great elasticity, and an extreme smoothness of the eye which effectually prevents the cutting of the thread. Knights & Co. are the inventors of a registered needle box.

[6442]

LEWIS, HENRY, & SON, *Church Green East, and Queen Street, Redditch.*—Sewing needles and fish hooks.

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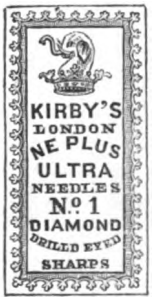
KIRBY, BEARD, & CO., 62 *Cannon Street West, E.C.*—Pins, needles, fish hooks, sewing cotton, and general warehousemen.

Obtained the Prize Medal, London, 1851; *Paris*, 1855.

PINS.



NEEDLES.

SEWING COTTON.

TRADE MARKS.

PINS of very superior finish; solid heads and adamantine points, stuck on paper, loose in lbs., and in boxes.

SEWING COTTON, double spun, celebrated for smooth finish and softness, warranted the lengths marked on the reels, and the sizes are apportioned to the needles in the following order, viz.

Needles, No. 1 to 5, 6, 7, 8, 9, 10, 11, 12.
Cotton, No. 12 to 16, $\frac{30}{24}$, $\frac{30}{36}$, $\frac{40}{48}$, $\frac{50}{60}$, $\frac{70}{80}$, $\frac{90}{100}$, $\frac{120}{150}$.

NEEDLES of high temper and superior finish, drilled and burnished eyes, warranted not to cut the thread; also their celebrated egg-eyed needles, large convenient eyes, also needles for every kind of fancy work.

FANCY BOXES OF PINS, 4-paper boxes, in excellent photographic and other designs, and 1 oz. and 2 oz. boxes. Needles in rich fancy-paper boxes, and elegant morocco and silk velvet portfolios.

SEWING-COTTON BOXES, in photographic and other designs, 1 and 2 dozen boxes.

To ensure the articles being genuine, purchasers should ask for Kirby, Beard & Co.'s manufactures, as their trade marks are sometimes imitated on spurious goods.

[6443]

MILWARD, HENRY, & SONS, *Redditch.*—Needles and fish hooks; extra quality needles, specially manufactured.

Obtained a silver Medal at the Paris Exhibition, 1855, *and a First-Class Medal at the New York Exhibition.*

The exhibitors are patentees of the patent method of wrapping needles, and manufacturers of the registered needle case.

Amongst the specimens will be found the needles saleable in each quarter, and all the different countries of the globe, and in addition to the ordinary sewing needles, needles for tailors, milliners, saddlers, harness makers, stay and mattress makers, sail makers, sack makers, needles for surgeons and veterinary surgeons; needles for knitting, netting, darning, worsted darning, crochet, embroidery, chenille and tambour work; needles for carpets, and carpet needles, and every description of needles for sewing machines.

There are also fish-hooks and fishing tackle for all waters, at home and abroad.

The interest that has always attached itself to the manufacture of needles, has induced Messrs. Milward & Sons to exhibit beautifully finished models of the whole in the Process Court, of the machinery required, from which it will be easy to obtain an idea of each process through which the needle passes. Amongst the most interesting is the pointing, both on account of the great danger, indeed certain death, formerly attending it, and of the simple machine called the "fan," by which this has been overcome, and by which the dangerous particles of steel formerly inhaled are drawn away from the "pointer." Attention may be also called to the ingenious counting machine, for the use of which the exhibitors are licensed by the patentees, by which a great saving of time is effected.

For further particulars, reference should be made to the Process Court, and the South Kensington Museum.

[6444]

MITCHELL, WILLIAM, *Washington Works, Birmingham, and 74 Cannon Street West, London.*—Case of metallic pens and penholders.

[6445]

MITCHELL, W., 41 *London Street, Fitzroy Square.*—Springs.

[6446]

MOGG, JOSEPH, & CO., *Adelaide Works, Redditch.*—Needles, fish hooks, and fishing tackle

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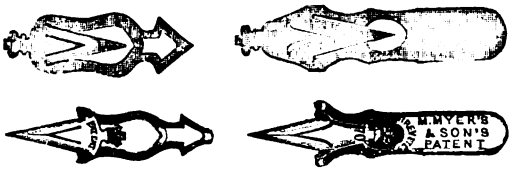
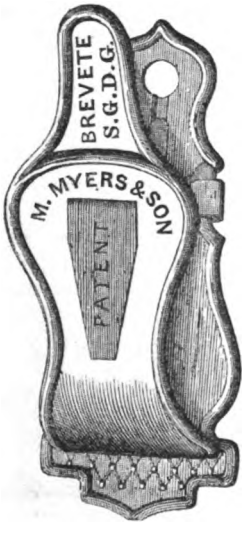
[6447]

MYERS & SON, *Charlotte Street Steel Pen Works, Birmingham.*—Steel pens, holders, letter clips, paper knives, drapers' ticket suspenders, &c.

Obtained Medals at the Great Exhibition, 1851, *and at the Paris Exhibition,* 1855.



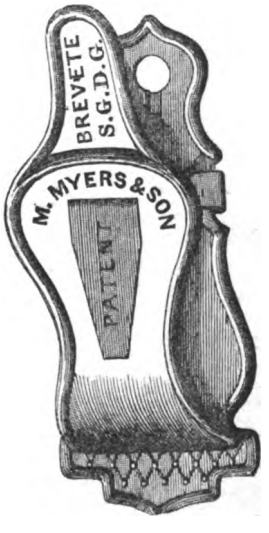
STEEL PENS.



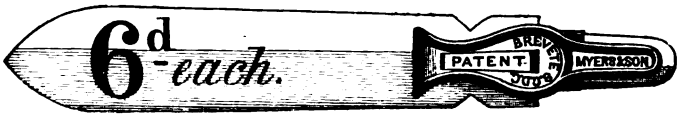
LETTER CLIP.

M. MYERS & SON beg respectfully to call the attention of the public to their recently patented novelties in paper knives, book markers, and letter clips, which, for adaptation, utility, and elegance, stand prominently forward as a great step in advance of any that have yet been before the public, and at a price so exceedingly moderate, that when known, will claim general adoption.

M. Myers & Son would also take the present opportunity of sincerely thanking the public for the very flattering preference they have given to their galvanized pens, and beg to assure them that they still continue to manufacture them with the same care and attention, through their patented process, which has secured for them the enviable distinction of being a reliable pen, as, in their freedom of action they glide over the surface of the paper with that smoothness which is so desirable to the general writer, and, at the same time, resists for a much longer period the acidity of the ink. They confidently recommend them to the commercial world, and the public generally. Drapers, haberdashers, &c., would do well to try our price ticket suspenders, as, by an ingenious but simple contrivance, they can be attached and detached instantly without the least injury to the most delicate article. Secured by letters patent.



LETTER CLIP.



PAPER KNIFE.

No. 1. METALLIC PENS, various.

No. 2. PATENT AXISSARY PENS.

The point of this pen is formed in the body and twisted over, by which means an axis is formed on each side of the pen, upon which the point works, and a new and an agreeable elasticity is produced.

No. 3. PEN HOLDERS, various.

No. 4. SKELETON POINTS, for quills.

By this patented invention, all the superior qualities of the steel pen are secured, combined with the acknowledged advantages which are only to be found in the natural quill.

No. 5. GILT, SILVERED, AND GALVANIZED PENS.

No. 6. THE PATENTED GAUGE PENS.

The point and the body of this pen are made separately, and so connected, that the one slides within the other, and by moving the point to a given gauge, any required elasticity is attained.

No. 7. PAPER KNIVES AND BOOK MARKERS, elegance, simplicity, and utility.

No. 8. LETTER CLIPS for adaptation, utility, and price, stand prominently forward as a great step in advance of any before the public.

No. 9. PRICE-TICKET SUSPENDERS, for drapers, haberdashers, &c. By an ingenious yet simple contrivance they can be attached or detached instantly, without the least injury to the most delicate fabric.

No. 10. PAPER HOLDERS, for stationers, &c.

No. 11. RAILWAY SAFETY TICKET HOLDERS.

No. 12. CRINOLINE FASTENERS.

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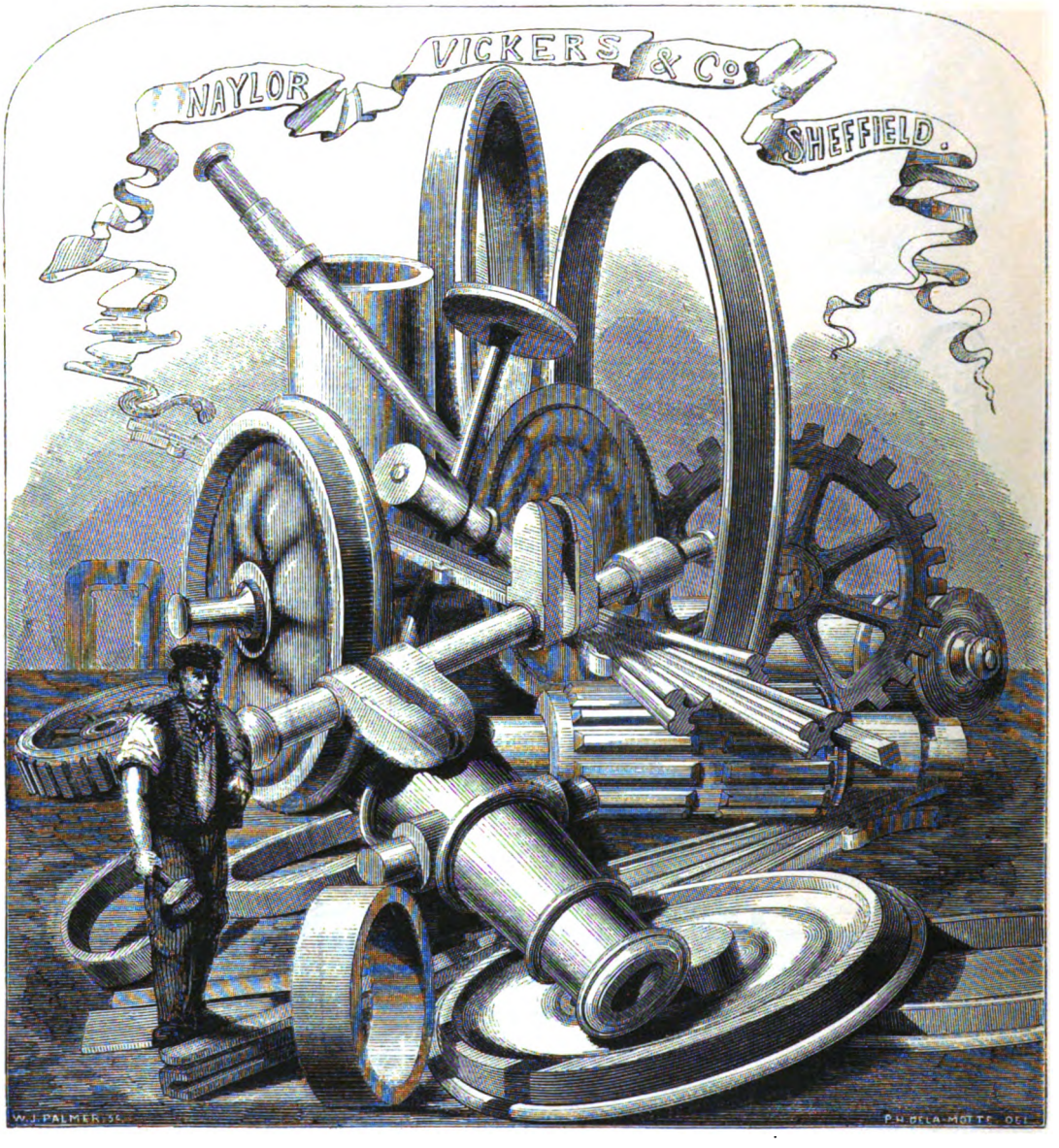
[6448]

NAYLOR, VICKERS, & Co., *Sheffield.*—Cast-steel disc wheels, tyres, crank and straight axles, castings to pattern.



STEEL CASTINGS AND FORGINGS.

Makers of all descriptions of bar, rod, and sheet steel, and of wrought cast-steel railroad tyres without weld.

Patent corrugation cast-steel disc wheels, with tyres in one solid piece.

Cast-steel crank and straight axles.

Cast-steel ordnance; cast-steel boiler plates.

Heavy cast-steel forgings and castings in steel to patterns.

For price lists, apply to Naylor, Vickers, & Co. River Don Works, Sheffield; 80 Lombard Street, London; 4 Cook Street, Liverpool; 99 John Street, New York; 80 State Street, Boston, U.S.; 425 Commerce Street, Philadelphia.

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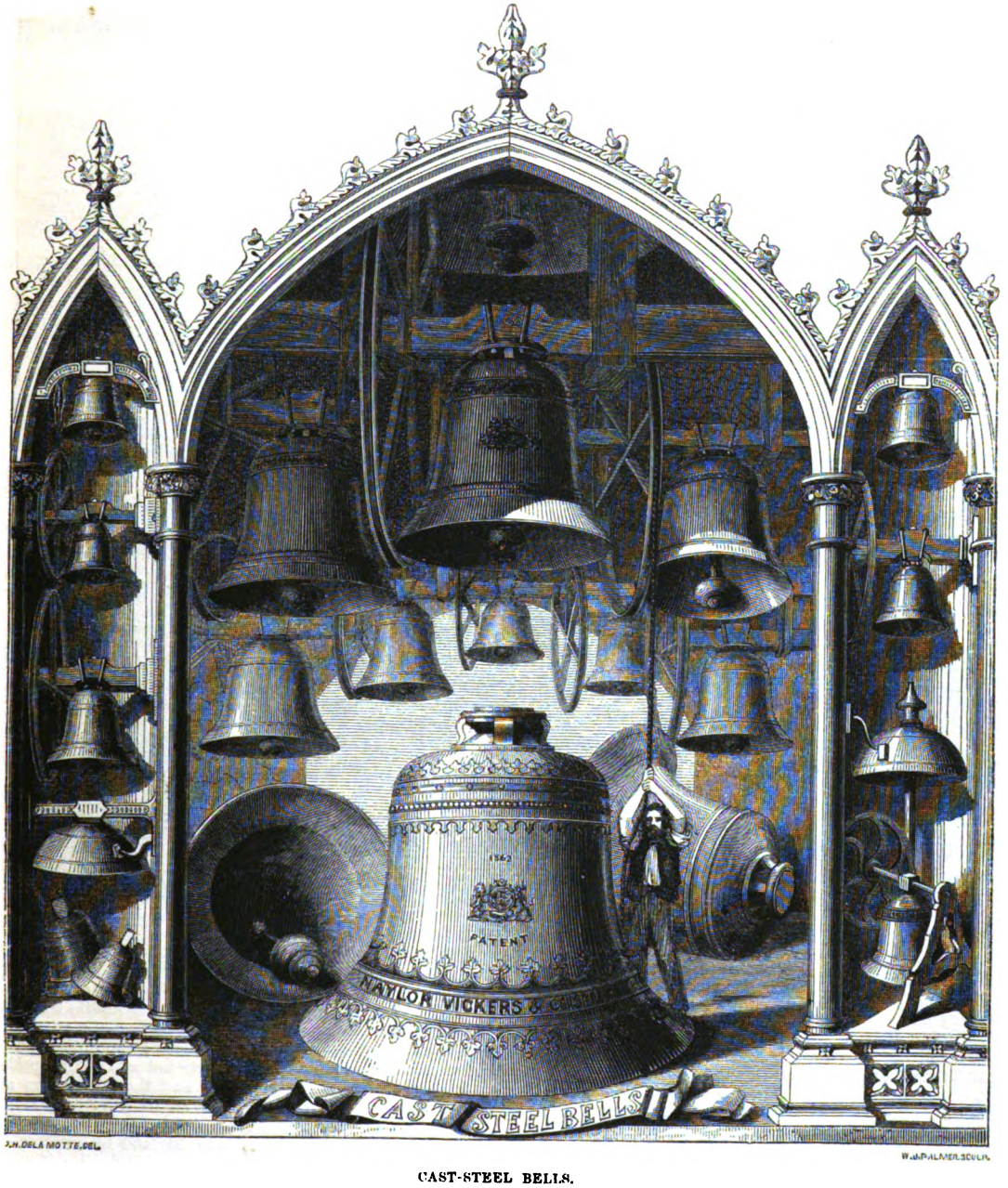
NAYLOR, VICKERS, & CO., *continued.*



CAST-STEEL BELLS.

. Cast-steel bells are stronger and more durable than bronze bells. Cast-steel bells of the same note and volume of sound, are only two-thirds the weight, and one-third the cost, of bronze bells. For example, the peal of eight cast-steel bells (shown in the above sketch), tenor 54 in. diameter, key E, weighs about 8,000 lbs.

Price £300

The largest bell exhibited by Naylor, Vickers, & Co. is 7 ft. 6 in. diameter, note G, 9,000 lbs. Price . £300

A list of the peals of cast-steel bells in use in Great Britain, with testimonials; also estimates for peals or single bells, may be obtained by applying to Naylor, Vickers, & Co. River Don Works, Sheffield; 80 Lombard Street, London; 4 Cook Street, Liverpool; 99 John Street, New York; 80 State Street, Boston, U.S. 425 Commerce Street, Philadelphia.

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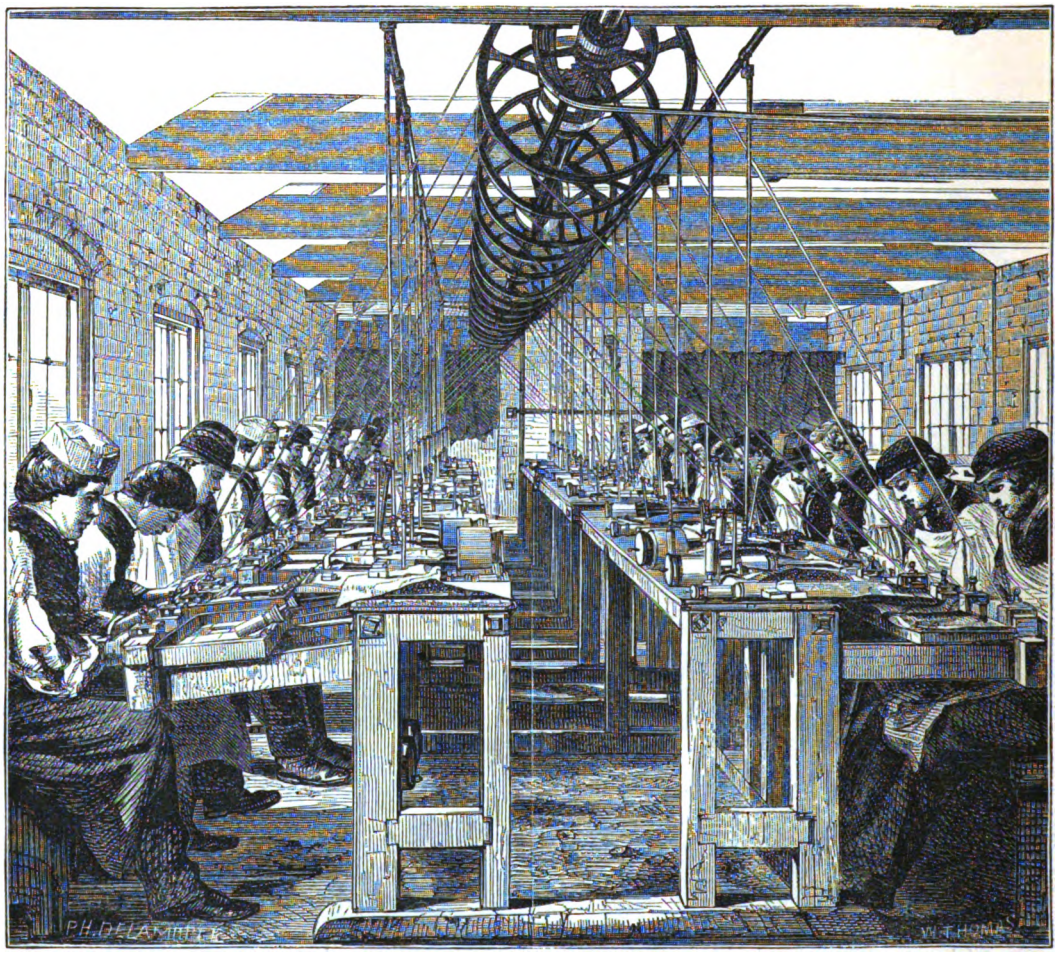
THOMAS, SAMUEL, & SONS, *British Needle Mills, Redditch.*—Improved spring steel needles and fish hooks.



A VISIT TO THE BRITISH NEEDLE MILLS, REDDITCH.

WHY are needles made at Redditch? Why should a beautiful and secluded part of the county of Worcester, many miles distant from what are termed the "manufacturing districts," contain a village, whose inhabitants, one and all, live directly or indirectly by making these little steel implements? The fact is demonstrable, but the reason is not. The good housewife who mends her child's pinafore, the milliner who decks out a lady in her delicate attire, the hard-working sempstress who supplies "made-up goods" to the shops, the school girl who works her sampler—all, however little they may be aware of the fact, are dependent principally on a Worcestershire village for the supply of their needles. Their "Whitechapel needles" are no longer made at Whitechapel, even if they ever were; and though they may in some cases seem to emanate from London manufacturers, the chances are that they were made at Redditch. Not that other towns are without indications of this branch of manufacture; but in them it is merely an isolated feature, while at Redditch, as we shall presently see, needle-making is the staple, the all-in-all, without which, almost every house in the place would probably be shut up; for although there is a fair sprinkling of the usual kind of workmen, shopkeepers, dealers, &c. these are only such as are necessary for supplying the wants of the needle-making population. It is a strange thing that the Redditch manufacturers themselves seem scarcely able to assign a reason why this branch of industry has centred there, or to name the period of its commencement. Indeed, the early history of the needle-trade is very indistinctly recorded. Stow tells us while speaking of the kind of shops found in Cheapside and other busy streets of London, that needles were not sold in Cheapside until the reign of Queen Mary, and that they were at that time made by a Spanish negro, who refused to discover the secret of his art. Another authority states that "needles were first made in England by a native of India, in 1545, but the art was lost at his death; it was, however, recovered in 1650, by Christopher Greening, who settled with his three children at Long Crendon, in Buckinghamshire." Whether the negro in one of these accounts is the same individual as the native of India mentioned in the other, cannot now be determined, nor is it more clear at what period Redditch became the centre of the manufacture. There are slight indications of Redditch needle-making for a period of two centuries, but beyond that all is blank.

A reader, who associates the potteries with the clay districts of North Staffordshire, and the smelting works with the coal and iron districts of South Staffordshire, will naturally seek to know whether any features distinguish Redditch which will enable us to assign a probable origin for the needle-manufacture there. A visitor, in any degree accustomed to watch the progress

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THOMAS, SAMUEL, & SONS, *continued.*

of manufactures, looks around him to seek for any indications whence he may account for the location of needle-making; he looks for a stream or canal, or something which may be to the manufacture in the relation of cause to effect; but very little of the kind is seen. Needle-making is nearly all the result of manual dexterity, requiring little aid from water or steam power. There are, it is true, a few water wheels employed for pointing and scouring the needles, but Redditch presents no other facilities for this purpose than such as are presented by a thousand other places in the kingdom. In short, there seems to be no other mode of accounting for the settlement of the needle-manufacture in this spot, than that which may be urged in reference to watchmaking in Clerkenwell, or coach-making in Long Acre. A needle-maker we will suppose—say two centuries ago—settled at Redditch, and gradually accumulated round him a body of workmen. A supply of skilled labour having been thus secured, another person set up in the same line. In time, the workmen's children learned the occupation carried on by their parents, and thus furnished an increased supply of labour, which in its turn, led to the establishment of other manufacturing firms. By degrees so many needles were made at Redditch, that the village acquired a reputation throughout the length and breadth of the land for this branch of manufacture, and hence it became a positive advantage for a maker to be able to say that his needles were "Redditch needles." This train of surmises may perhaps approach pretty nearly to the truth.

Let us, however, leave conjecture and proceed to facts. There are in Redditch about half-a-dozen manufacturers who conduct the needle-manufacture on a large scale, and employ a considerable number of persons. Some work in factories built by and conducted under the superintendence of the master manufacturers; while others work at their own homes. In no occupation, perhaps, is the division of labour more strictly carried out than in needle-making; for the man who cuts the wire does not point, nor does the pointer make the eyes or polish the needles. Both within and without the factory the same system of division is kept up; for a cottager who procures work from a needle-manufacturer does not undertake the making of a needle, but only one particular department, for which he is paid at certain recognised prices. Many of the workpeople live a few miles distant and come with their work at intervals of a few days, a plan which can be adopted without much inconvenience, since a considerable quantity of these little articles may be packed in a small space. It is, we believe, estimated that the number of operatives in Redditch is about three thousand, and in the whole district of which Redditch is the centre, six or seven thousand, of whom a considerable number are females.

The general name of "mills" is given to the needle-factories, each one having some distinctive name whereby it may be indicated. Thus the establishment which we have been obligingly permitted to visit, and the arrangements of which will be here described, is called the "British Needle Mills." To the British Needle Mills of S. Thomas & Sons, then, our visit is directed.

This factory has been recently constructed, and is situated at one extremity of the village. It consists of a number of court-yards or quadrangles, each surrounded by buildings wherein the manufacture is carried on. The object of this arrangement seems to be to obtain as much light as possible in the workshops, since most of the departments of needle-making require a good light. Some of the rooms in the factory are small, containing only three or four men; while others contain a great many workmen, according to the requirements of the several processes of the manufacture. From the upper rooms of the factory, the surrounding hilly districts of Worcestershire are seen over a wide extent, wholly uninterrupted by any indications of manufacture or town bustle; and it is while glancing over this prospect that one wonders how on earth needle-making came to speckle such a scene.

The sub-divisions of the factory correspond with those in the routine of manufacture, and we accordingly find that, while some of the shops are occupied by men, others contain only females, and others again furnish employment chiefly for boys. We should surprise many a reader were we to enumerate all the processes incident to the manufacture of a needle, giving to each the technical name applied to it in the factory. The number would amount to somewhere about thirty, but it will be more in accordance with our object to dispense with such an enumeration, and to present the details of manufacture in certain groups, without adhering to a strictly technical arrangement.

First, then, for the material. It is scarcely necessary to say that needles are made of steel, and that the steel is brought into the state of wire before it can assume the form of needles. The needle-makers are not wire-drawers; they do not prepare their own wire, but purchase it in sizes varying with the kind of needles which they are about to make. We will suppose, therefore, that the wire is brought to the needle factory and deposited in a store-room. This room is kept warmed by hot air to an equable temperature, in order that the steel may be preserved free from damp or other sources of injury. Around the walls are wooden bars or racks, on which are hung the hoops of wire. Each hoop contains what is called a packet, the length varying according to the diameter. Perhaps it may be convenient to take some particular size of needle and make it our standard of comparison during the details of the process. The usual sizes of sewing needles are from No. 1, of which twenty-two thicknesses make an inch, to No. 12, of which there are a hundred to an inch. Supposing that the manufacturer is about to make sewing needles of that size known as No. 6, then the coil of wire is about two feet in diameter; it weighs about 13 lbs.; the length of wire is about a mile and a quarter; and it will produce forty or fifty thousand needles. The manufacturer has a gauge, consisting of a small piece of steel, perforated at the edge with eighteen or twenty small slits, all of different sizes, and each having a particular number attached to it. By this gauge the diameter of every coil of wire is tested, and by the number every diameter of wire is known.

A coil of wire when about to be operated upon, is carried to the "cutting shop," where it is cut into pieces equal to the length of two needles. Fixed up against the wall of the shop is a ponderous pair of shears, with the blades uppermost. The workman takes probably a hundred wires at once, grasps them between his hands, rests them against a gauge to determine the length to which they are to be cut, places them between the blades of the shears, and cuts them by pressing his body or thigh against one of the handles of the shears. The coil is thus reduced to twenty or thirty thousand pieces, each about three inches long, and as each piece had formed a portion of a curve two feet in diameter, it is easy to see that it must necessarily deviate somewhat from the straight line. This straightness must be rigorously given to the wire before the needle-making is commenced, and the mode by which it is effected is one of the most remarkable in the whole manufacture. Around the walls of the shop we see a number of iron rings hung up, each from three or four to six or seven inches in diameter, and a quarter or half an inch in thickness. Two of these rings are placed upright on their edges at a little distance apart, and within them are placed many thousands of wires, which are kept in a group by resting on the interior edges of the two rings. In this state they are placed on a shelf in a small furnace, and there kept till red hot. On being taken out at a glowing heat, they are placed on an iron plate, the wires being horizontal and the rings in which they are inserted being vertical. The process of "rubbing" (the technical name for the straightening to which we allude then) commences. The workman, as here represented, takes a long piece of iron, and inserting it between the two rings, rubs the wires backwards and forwards, causing

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THOMAS, SAMUEL, & SONS, *continued.*

THE PROCESS OF "RUBBING."

each to roll over on its own axis, and also over and under those by which it is surrounded. The noise emitted by this process is just that of filing; but no filing takes place, for the rubber is smooth, and the sound arises from the rolling of one wire against another. The rationale of the process is this:—the action of one wire on another brings them all to a perfectly straight form, because any convexity or curvature in one wire would be pressed out by the close contact of the adjoining ones. The heating of the wires facilitates this process, and the workman knows by the change of sound, when all the wires have been "rubbed" straight.

Our needles have now assumed the form of perfectly straight pieces of wire, say a little more than 3 in. in length, blunt at both ends, and dulled at the surface by exposure to the fire. Each of these pieces is to make two needles, the two ends constituting the points; and both points are made before the piece of wire is divided in two. The pointing immediately succeeds the rubbing, and consists in grinding down each end of the wire till it is perfectly sharp. The workman sits on a stool or "horse" a few inches distant from the stone, and bends over it during his work. He takes fifty or a hundred wires in his hand at once, and holds them in a peculiar manner. He places the fingers and palm of one hand diagonally over those of the other, and grasps the wires between them, all the wires being parallel. The thumb of the left hand comes over the back of the fingers of the right, and the different knuckles and joints are so arranged, that every wire can be made to rotate on its own axis, by a slight movement of the hand, without any one wire being allowed to roll over the others. He grasps them so that the end of the wires (one end of each) projects a small distance beyond the edge of the hand and fingers, and these ends he applies to the grindstone in the proper position for grinding them down to a point. It will easily be seen, that if the wires were held fixedly, the ends would merely be bevelled off, in the manner of a graver, and would not give a symmetrical point; but by causing each wire to rotate while actually in contact with the grindstone, the pointer works equally on all sides of the wire, and brings the point in the axis of the wire. At intervals of every few seconds, he adjusts the wires to a proper position against an iron plate, and dips their ends in a little trough of water between him and the grindstone. Each wire sends out its own stream of sparks, which ascends diagonally in a direction opposite to that at which the workman is placed. So rapid are his movements, that he will point seventy or a hundred needles, forming one hand-grasp, in half a minute, thus getting through ten thousand in an hour.

The reader will bear in mind, that the state of our embryo needle is simply that of a piece of dull straight wire, about 3 in. long (supposing 6's to be the size), and pointed at both ends. The next process is one of a series by which two eyes or holes are pierced through the wire, near the centre of its length, to form the eyes of the two needles which are to be fashioned from the piece of wire. A number of very curious operations are connected with this process, involving mechanical and manipulative arrangements of great nicety. Those who are learned in the qualities of needles—as that they will not "cut in the eye" and so forth—will be prepared to expect that much delicate workmanship is involved in the production of the eyes, and they will not be in error in so supposing. Most of the improvements which have from time to time been introduced in needle-making, relate more or less to the production of the eye. In the commoner kinds of needles, many processes are omitted which are essential to the production of the finer qualities; but it will show the whole nature of the operations better for us to take the case of those which involve all the various processes.

After being examined, when the pointer has done his portion of the work to them (an examination which is undergone after every single process throughout the manufacture), the wires are taken to the "stamping shop," where the first germ of an eye is given to each half of every wire. The stamping machine consists of a heavy block of stone, supporting on its upper surface a bed of iron, and on this bed is placed the under half of a die or stamp. Above this is suspended a hammer, weighing about 30 lbs. which has on its lower surface the other half of the die or impress. The hammer is governed by a lever moved by the foot, so that it can be brought down exactly upon the iron bed. The form of the die or stamp may be best explained by stating the work which it is to perform. It is to produce the "gutter" or channel in which the eye of the needle is situated, and which is to guide the thread in the process of threading a needle.

But besides the two channels or gutters, the stampers make a perforation partly through the wires, as a means of marking exactly where the eye is to be. The device on the two halves of the die is consequently a raised one, since it is to produce depressions in the wire. The workman holding in his hand several wires, drops one at a time on the bed-iron of the machine, adjusts it to the die, brings down the upper die upon it by the action of the foot, and allows it to fall into a little dish when done. This he does with such rapidity that one stamper can stamp 4,000 wires, equivalent to 8,000 needles, in an hour, although he has to adjust each needle separately to the die.

To this process succeeds another, in which the eye of the needle is pierced through. This is effected by boys, each of whom works at a small hand-press, and the operation is at once a minute and ingenious one. The boy takes up a number of needles or wires, and spreads them out like a fan. He lays them flat on a small iron bed or slab, holding one end of each wire in his left hand, and bringing the middle of the wire to the middle of the press. To the upper arm of the press are affixed two hardened steel points or cutters, being in size and shape exactly corresponding with the eyes which they are to form. Both of these points are to pass through each wire, very nearly together, and at a small distance on either side of the exact centre of the wire. The wire being placed beneath the points, the press is moved by hand, the points descend, and two little bits of steel are cut out of the wire, thereby forming the eyes for two needles. As each wire becomes thus pierced, the boy

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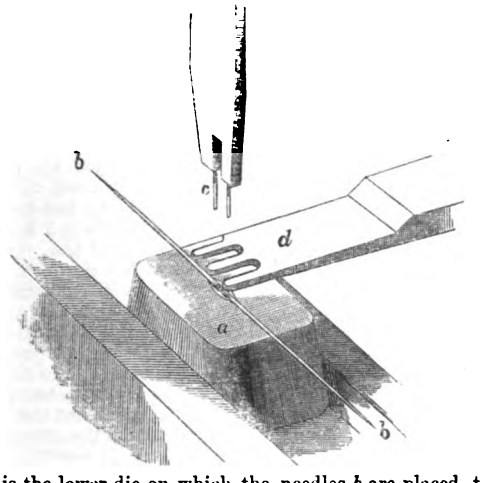
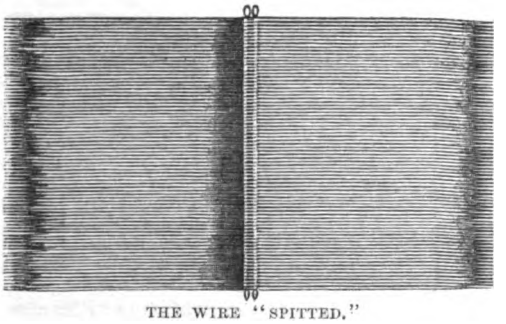
THOMAS, SAMUEL, & SONS, *continued.*

shifts the fan-like array of wires until another one comes under the piercers, and so on throughout. The press has to be worked by the right hand for piercing each wire, and the head of the boy is held down pretty closely to his work, in order that he may see to "eye" the needles properly. Were not the wires previously prepared by the stamper, it would be impossible thus to guide the piercers to the proper point, but this being effected, patience, good eye-sight, and a steady hand effect the rest.



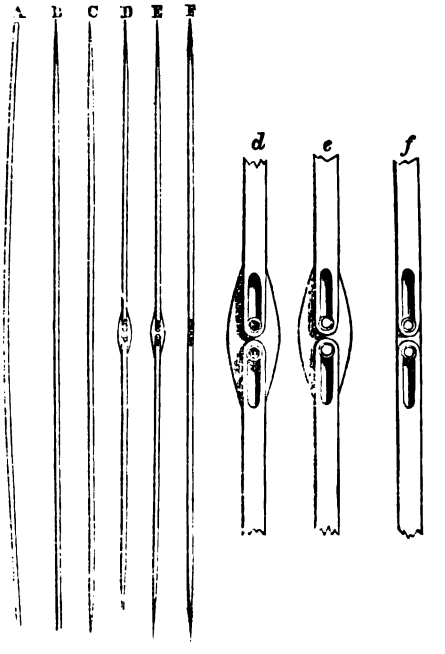
(*a* is the lower die on which the needles *b* are placed, to be pierced by the points *c*, guided by the apparatus *d*.)

There are several processes about this stage which are effected by boys; some of these little labourers take the needles when they have been "eyed" and proceed to "spit" them, that is, to pass a wire through the eye of every needle. Two pieces of fine wire, perhaps three or four inches in length, are prepared, the diameter corresponding exactly with the size of the needle eye. These two pieces of wire are held in the right hand, parallel, and at a distance apart equal to the distance between the two eyes in each needle-wire. The pierced needles, being held in the left hand, are successively threaded upon the two pieces of smaller wire, till, by the time the whole is filled, the assemblage has something the appearance of a fine toothed comb. A workman then files down the bur or protuberances left on each side of the eye by the stamper.



THE WIRE "SPITTED."

It must be borne in mind that throughout all these operations the needles are double; that is, that the piece of wire three inches in length, which is to produce two needles an inch and a half long each, is still whole and undivided, the two eyes being nearly close together in the centre, and the two points being at the ends. Now, however, the separation is to take place. The filer, after he has brought down the protuberances on each wire, but before he has laid the comb of wires out of his hand, bends and works the comb in a peculiar way until he has broken the comb into two halves, each half "spitted" by one of the fine wires. The needles have arrived at something like their destined shape and size, for they are of the proper length and have eyes and points. In the annexed cut we can trace the wire through the processes of change hitherto undergone.



(*A* the wire for two needles; *B* the same, pointed at one end; *C* pointed at both ends; *D* the stamped impress for the eyes; *E* the eyes pierced; *F* the needles just before separation; *d*, *e*, *f*, enlargements of *D*, *E*, *F*.)

But although we have now little bits of steel which might by courtesy be called needles, they have very many processes to undergo before they are deemed finished, especially if, in accordance with our previous supposition, they are of the finer quality.

The needles are by this time pointed and eyed, but before they can be brought to that beautifully finished state with which we are all familiar, it is necessary that they should be "hardened" and "tempered" by a peculiar application of heat. After being examined to see that the preceding processes are fitly performed, the needles are taken to a shop provided with ovens or furnaces. They are laid down on a bench, and by means of two trowel-like instruments spread in regular thick layers on narrow plates or trays of iron. In this way they are placed on a shelf or grating in a heated furnace. When the proper degree of heating has been effected, the door is opened and the needles are shifted from the iron tray into a sort of colander or perforated vessel immersed in water or oil. When they are quite cooled the hardening is completed, and if it has been effected in water the needles are simply dried; but if in oil, they are well washed in an alkaline liquor to free them from the oil. Then ensues the tempering process. The needles are placed on an iron plate, heated from beneath and moved about with two little trowels until every needle has been gradually brought to a certain desired temperature.

We now leave the furnace-room and proceed to one of the upper rooms of the factory, where a multitude of minor operations are conducted. The needles have become slightly distorted in shape by the action of the heat in the processes just described, and to rectify this they

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THOMAS, SAMUEL, & SONS, *continued.*

undergo the operation of "hammer straightening." A number of females are seen seated at a long bench, each with a tiny hammer, giving a number of light blows to the needles; the needles being placed on a small steel block with a very smooth upper surface. This is rather a tedious part of the manufacture, the workwomen not being able to straighten more than five hundred needles in an hour, a degree of quickness much less than that which we have had hitherto to notice.

We leave the tinkling hammers and follow the needles to the only part of the manufacture which involves apparatus other than of a small size. This is the "scouring" process. In one of the lower rooms of the factory are machines looking like mangles, or, perhaps, more correctly like marble polishing machines, a square slab or rubber working to and fro on a long bench. The object of this process is to rub the needles one against another for a very long period, till the surfaces of all have become perfectly smooth, clean, and true. This is effected in a curious manner. A strip of thick canvas is laid open in a small hollow tray, and on this a heap of needles is laid, all the needles being parallel one with another, and with the length of the cloth. The needles are then, with soft soap, emery, and oil, tied up tightly in the canvas, the whole forming a compact roll about two feet long and three inches in thickness; these are placed under the runners of the scouring machines, two rolls to each machine. A steam engine gives to the runners, by connected mechanism, a reciprocating or backward and forward motion, pressing heavily on the rolls of needles, and causing all the needles of each bundle to roll one over another. By this action an intense degree of friction is exerted among the needles, whereby each one is rubbed smooth by those which surround it. For eight hours uninterruptedly this rubbing or scouring is carried on, after which the needles are taken out, washed in suds, placed in new pieces of canvas, with a new portion of soap, emery, and oil, and subjected to another eight hours' friction. Again and again is this repeated, insomuch that for the best needles the process is performed five or six times over, each time during eight hours' continuance. This is one of the points in which the difference is shown between various qualities of needles, the length of the scouring being correspondent with the excellence of the production.

Again we accompany the needles to another part of the factory, being that which is technically termed the "bright shop," in which many processes are carried on in reference to the finishing of needles. The needles are examined after being scoured and are placed in a small tin tray, where, by shaking and vibrating in a curious manner, they are all brought into parallel arrangement. From thence they are removed into flat paper trays in long rows or heaps, and passed on to the "header," generally a little girl, whose office is to turn all the heads one way, and all the points the other. This is one among the many simple but curious processes involved in this very curious manufacture, which surprise us by the rapidity and neatness of execution. The girl sits with her face towards the window, and has the needles ranged in a row or layer before her, the needles being parallel with the window. She draws out laterally to the right those which have their eyes on the right hand, into one heap, and to the left those which have their eyes in that direction, in another heap.

About this time, too, the needles are examined one by one, to remove those which have been broken or injured in the long process of scouring; for it sometimes happens that as many as eight or ten thousand, out of fifty thousand, are spoiled during this operation. Most ladies are conversant with the merits of "drilled-eyed needles" warranted "not to cut the thread." These are produced by a modern improvement, whereby the eye, produced by the stamping and piercing processes before described, is drilled with a very fine instrument, by which its margin becomes as perfectly smooth and brilliant as any other part of the needle. To effect this, the needle is first "blued;" that is, the head is heated so as to give it the proper temper for working. Next comes the drilling. Seated at a long bench are a number of men and boys, with small drills working horizontally with great rapidity. The workman takes up a few needles between the finger and thumb of his left hand, spreads them out like a fan, with the eyes uppermost, brings them one at a time opposite the point of the drill, and drills the eye, which is equivalent to making it even, smooth and polished. He moves the thumb and finger, so as to bring the opposite side of the needles, in succession, under the action of the drill; and thus gets through his work with much rapidity. The preparation of the drills, which are small pieces of steel three or four inches long, is a matter of very great nicety, and on it depends much of that beauty of production which constitutes the pride of a modern needle-manufacturer.

We next pass into a large room (see illustration on page 148), where a multitude of little wheels are revolving with great rapidity, some intended for what is termed "grinding" and setting the needles, and some for polishing. The men are seated on low stools, each in front of a revolving wheel, which is at a height of perhaps two feet from the ground. All the wheels are connected by straps and bands with a steam-engine in the lower part of the factory. A constant humming noise is heard in the room, arising from the great rapidity of revolution among a number of wheels; and it is not difficult for the ear to detect a difference of tone or pitch among the associated sounds, due to differences in the rate of movement. The workman takes up a layer or row of needles, between the fingers and thumbs of the two hands, and applies the heads to the stones in such a manner as to grind down any small asperities on the surface. As the small grindstones are revolving three thousand times in a minute, it is plain that the steel may soon be sufficiently worn away by a slight contact with the periphery of the stone.

The grinders and the polishers sit near together, so that the latter take up the series of operations as soon as the former have finished. The polishing wheels consist of wood coated with buff leather, whose surface is slightly touched with polishing paste. Against these wheels the polishers hold the needles, applying every part of the cylindrical surface in succession; first holding them by the pointed end, and then by the eye end. About a thousand in an hour can thus be polished by each man; and, when they leave his hands, the needles are finished.

We have still to see the needles papered. In one of the rooms a number of females are cutting the papers, separating the needles into groups of twenty-five each, and folding them into the neat oblong form so well known to all users of a "paper of needles." So expert does practice render the workwomen, that each one can count and paper three thousand needles in an hour. The papered needles then pass to another room, where boys paste on the labels bearing the manufacturer's name. Even here there are sundry little contrivances for expediting the process, which would scarcely be looked for by common observers. When the papers have been dried on an iron frame, in a warm room, they are packed into bundles of ten or twenty papers each; which are further packed in square parcels containing ten, twenty, or fifty thousand needles, inclosed, if for exportation, in soldered tin cases. As a means of judging the bulk of the needles, we may state that ten thousand 6's form a packet about six inches long, three and a half wide, and under two in thickness.

Thus have we followed the manufacture to its close. None but the best needles undergo the whole of the processes enumerated; but we have wished to give them as a means of estimating the complexity of the manufacture of an article apparently so humble.

The arrangements of the "British Needle Mills," as to apparatus, &c. are adapted to the production of two hundred millions of best needles per annum. These are startling results, and show that, in considering the seats of manufacture in England, we must not forget to include the remarkable Worcestershire village of Redditch.

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[6450]

PAGE, W. & J., 70 & 71 *Mott Street, Birmingham.*—Specimens of corkscrews and other steel toys.

[6451]

PEACE, JOSEPH, & Co., *Sheffield.*—Saws; bright rolled steel, and saws from same; crinoline; steel busks.

[6452]

PERRY, JAMES, & Co., 37 *Red Lion Square, and* 3 *Cheapside.*—Steel and gold pens, penholders, and stationers' sundries.

[6453]

REYNOLDS, G. W., & Co., 12 *Cheapside, London; and Birmingham.*—Steel wire, crinoline steel, umbrella frames, &c.

[6454]

ROWELL, JEREMIAH, 7 *St. Alban's Row, Carlisle.*—Artificial flies and fish hooks.

[6455]

SCHELHORN, G., 158 *Hockley Hill, Birmingham.*—Penholders of every description.

[6456]

SHORTRIDGE, HOWELL, & Co., *Hartford Street Works, Sheffield.*—Steel files and general articles.

SHORTRIDGE, HOWELL, & Co., merchants, steel converters and refiners, forge, tilts, and rolling mills.

Description of steel, &c. exhibited—

Best cast-steel in bars; cast-steel rolls; Howell's patent homogeneous metal in bars and sheets. Homogeneous metal tubes for boilers, and samples of same bent in various forms, showing the extreme ductility of the metal; also bars of the same metal bent cold in various forms; glass case containing specimens of the ends of cast-steel ingots, showing the fracture up to 10 inches square; and glass case containing samples of best cast-steel files for engineers' and machinists' purposes; cast-steel shell to be charged with molten iron on Martin's principle; Howell's patent coupling chains for railway carriages, &c. in one continuous coil.

London Offices: 39 Bedford Street, Strand; New York Store, 24 Cliffe Street.

[6457]

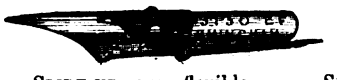
SMITH, JOHN WRIGHT, *High Cross Street, Leicester.*—Patent self-acting and other hosiery needles.

[6458]

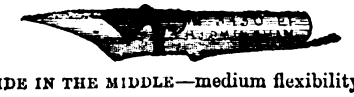
SMITH & HOUGHTON, *Warrington.*—Superior qualities of pianoforte wire, pinion and round steel wire, &c.

[6459]

SOMMERVILLE, A., & Co., *Birmingham.*—Best-class carbonized patent regulator, enamelled, gilt-pointed, and other steel pens.



SLIDE UP—very flexible.



SLIDE IN THE MIDDLE—medium flexibility.

SLIDE DOWN—hard.

Registered metal spring pattern card, showing 708 different numbers of steel pens, patent and other steel pen boxes and cases.

Best class carbonized steel pens. Celebrated gilt pointed steel pens on white and blue steel.

A large model, moved by machinery, of A. SOMMERVILLE & Co.'s patent regulating spring slide pens. By moving the spring slide up or down the pen, every degree of flexibility is obtained.

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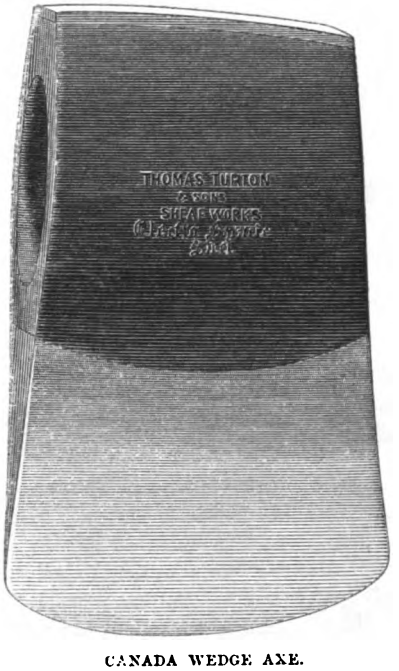
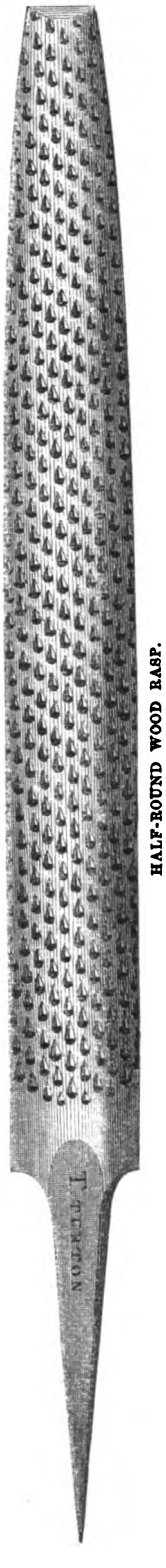
TURTON, THOMAS, & SONS, *Sheaf and Spring Works, Sheffield;* 17 *King William Street, City, London;* 10 *Rue du Grand Chantier, Paris;* 83 *John Street, New York;* 3 *North Street, Fifth Street, Philadelphia.*—Steel files, edge tools, railways springs, &c.

FLAT BASTARD.

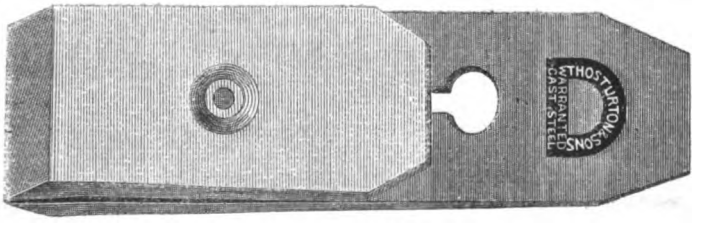


CANADA WEDGE AXE.

SCOTCH SCREW AUGER.



HALF-ROUND WOOD RASP.



DOUBLE PLANE IRON.

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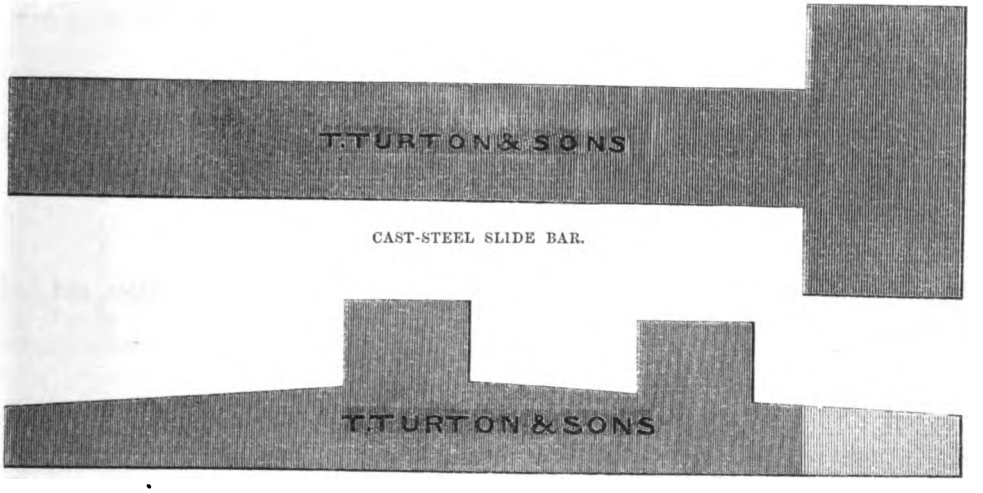
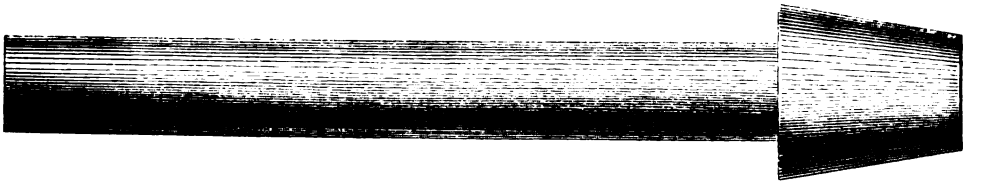
TURTON, THOMAS & SONS, *continued.*

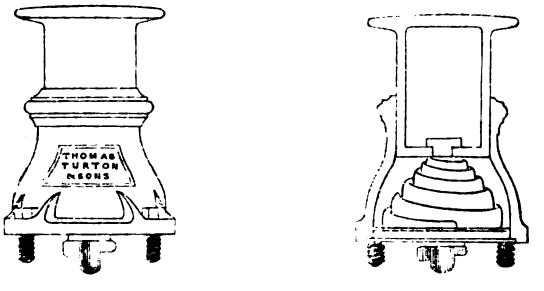


CAST-STEEL SLIDE BAR.

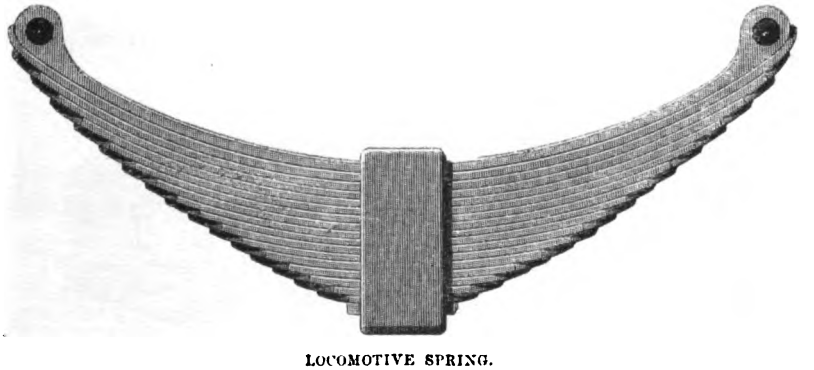
CAST-STEEL SLIDE BAR.



CAST-STEEL PISTON ROD.



RAILWAY BUFFER WITH PATENT CONICAL SPRING.



LOCOMOTIVE SPRING.

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[6460]

SPENCER, JOHN, & SONS, *Newcastle-on-Tyne.*—Cast-steel tyres, volute spring buffers, springs, steel, and files.

[6461]

THOMAS, SAMUEL, & SONS, *British Needle Mills, Redditch.*—Improved steel spring needles and fish hooks. (*See pages* 148 *to* 152.)

[6462]

TOWNSEND, GEORGE, & CO., *Redditch and London.*—Machine and other needles, and tools for making them.

[6463]

TURNER, R., & CO., *London; and Old Factory, Redditch.*—Sewing machine and other needles, and tools for making them.

[6464]

TURNEY, GEORGE LEONARD, 20 *Lawrence Lane, Cheapside.*—Needles in cylinder cases and pins in books.

[6465]

TURNOR, M., & CO., *Icknield Port Road, Birmingham.*—Carbonized, galvanized, and gilt pens; holders; patent rectangular pen-boxes.

[6466]

TURTON, BROTHERS, *Phœnix Steel Works, Sheffield.*—Steel files, saws, engineering tools, &c.

[6467]

TURTON, THOMAS, & SONS, *Sheaf and Spring Works, Sheffield.*—Steel files, edge tools, railway springs, &c. (*See pages* 154 *and* 155.)

[6468]

WALKER, HENRY, 47 *Gresham Street, and Alcester.*—Patent ridged and other needles, fish hooks, &c.

H. WALKER'S new needles. The patent ridged eyes are easily threaded, and work without the slightest drag. | A hundred post-free for 12 stamps, of any respectable dealer.

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SUB-CLASS B.—*Cutlery and Edge Tools.*

[6480]

ADDIS, JAMES BACON, 159 *Waterloo Road.*—Carvers', carpenters', print cutters', engravers' masons', plasterers', turning sculptors', and geological screw tools and saws.

[6481]

ADDIS, SAMUEL JOSEPH, 49 *and* 50 *Worship Street, Shoreditch.*—Assortment of carvers' and general edge tools.

[6482]

ALLARTON, THOS., & POWELL, *Birmingham.*—Awls, and sewing-machine needles, of every size and shape.

[6483]

BADGER, CHARLES, 1 *Stangate, Lambeth, S.*—Planes in iron and gun-metal, for joiners, cabinet makers, &c.

[6484]

BAKER, W., *Pembroke Street, London, N.*—Awls, trade bodkins, and needles.

[6485]

BARKER, ROBERT, & SON, *Easingwold.*—Butchers' and table steels, manufactured from the best refined cast-steel.

[6486]

BEACH, WILLIAM, *Salisbury.*—Case of assorted cutlery of Salisbury manufacture.

This case contains carving, table, sportsmen's, pocket, pen, pruning, and paper knives; scissors, and cases of ditto; razors, daggers, &c. These goods are forged from the best cast-steel, and ground and fitted by the exhibitor.

[6487]

BEARDSHAW, GEORGE, *Tomcrop Lane, Sheffield.*—Table, dessert, and carving knives and forks, palette, pruning, farriers', butchers', and shoe knives, bowie and bread knives, &c.

[6488]

BOLSOVER, THOMAS, *Ford, Ridgeway, Sheffield.*—Scythes, sickles, and reaping hooks, suitable for all parts of the world.

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[6489]

BOND, WM. J., *Bethnal Green Road, London.*—Saw, cabinet, bench, hand screw, and mechanical tools.

The exhibitor is a manufacturer of cabinet work, benches with double screw, also with single screw, and double slide for keeping the chop at all times parallel, and with end or cramp screw.

He also makes every description of hand screw, bench screws and chops, carvers' wood vices, &c. He supplies chests of tools fitted complete, from 18*s*.

[6490]

BOOTH, HENRY E., & CO., *Norfolk Works, Norfolk Lane, Sheffield.*—Table knives and forks, spear, butcher, bowie, and dagger knives.

Table knives and forks, spear point, palette, and butchers' knives, bowie, dagger, and hunting knives,

also plated desserts, razors, and general cutlery, suitable for home and export trade.

[6491]

BROOKES & CROOKES, *Atlantic Works, Sheffield.*—Fine pen and sportsmen's knives, razors, and dressing case fittings.

[6492]

BROWN, HENRY, & SONS, *Western Works*, 108 *Rockingham Street, Sheffield.*—Braces, bits, joiners' tools, augers, gimblets, skates, tool-chests.

[6493]

BUCK, JOSEPH, *Newgate Street, and Waterloo Road, London.*—Mechanical tools for engineers, carpenters, &c.

The following goods are manufactured by this exhibitor, and supplied wholesale, retail, and for exportation.

Manufacturer of every description of saws, planes, and tools for engineers, carpenters, cabinet makers, joiners, coachmakers, carvers, wheelwrights, coopers, plumbers, &c.

Lathes, and every description of tools adapted for turning.

Circular saws from 1 to 60 in. diameter.

Mill, veneer, and endless band saws.

Cutlery of the best quality.

Fret-cutting machines.

Buhl saw-frames, and tools for buhl work and ornamental carving.

[6494]

BUXTON, E. J., & CO., *Duke Place, Sheffield.*—Electro-plated goods upon Britannia metal.

[6495]

CHAMPION & CO., 169 *Broad Lane, Sheffield.*—Fine scissors.

[6496]

COCKBAIN, JOHN, *Portland Place, Carlisle.*—Joiners' and cabinet tools.

[6497]

DIGGINS, GEORGE, 20 *Bessborough Place, Pimlico.*—Iron and metal planes; castings, rough and machine planed.

[6498]

DRABBLE, JAMES, & CO., *Orchard Works, Sheffield.*—Table knives and forks; spear, butchers', and dagger knives.

These exhibitors manufacture knives, forks, &c. entirely by machinery, and are thus enabled to supply goods more uniform in appearance, and as good in quality, at less cost than where hand labour is employed. The small case exhibited by them contains a fair sample of their productions.

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[6499]

EADON, MOSES, & SONS, *President Works, Sheffield.*—Steel saws, files, machine knives, hammers, &c.

[6500]

EASTWOOD, GEORGE, 31 *Walmgate, York.*—Assortment of planes, with modern improvements, suitable for joiners, cabinet makers, &c.

[6501]

FIRTH, THOMAS, & SONS, *Norfolk Works, Sheffield.*—Files, saws, and edge tools; cast steel; large forgings in cast steel.

[6502]

FLETCHER, JOHN CARR, *Crown Works, Sheffield.*—Chisels, plane irons, axes, adzes, hatchets; augers, hammers, compasses, pliers.

[6503]

FULLER, JOHN H., 70 *Hatton Garden.*—Patent tube cutters, stocks and dies, taps, &c.

[6504]

GALLIENNE, GEORGE, 138 *Goswell Street.*—A general assortment of cutlery; boar spears, hunting knives, &c.; a very large bread knife, and trowel slicer.

[6505]

GIBBINS, J., & SONS, *Sheffield.*—Scissors; nail and champagne nippers; pruning shears and pocket cutlery.

[6506]

GILBERT, BROTHERS, 60 *St. Philip's Road, Sheffield.*—Razors; pen, pocket, and sportsmen's knives of all kinds.

[6507]

GILPIN, WILLIAM, SEN., & CO., *Wedges Mills, Cannock, Staffordshire.*—Edge tools, patent augers, matchets, iron and steel.

[6508]

GORRILL, ROBERT, & SON, 159 *Eyre Street, Sheffield.*—Fine scissors.

[6509]

GRAY, JOHN H., *Pelham Street, Nottingham.*—Improved skates.

[6510]

GREENSLADE, E. A. & W., *Thomas Street, Bristol.*—Planes.

[6511]

GREER, JAMES, 90 *Newgate Street.*—Specimens of London made table cutlery; also knives used in various trades.

The best plain ivory handle table knives, 30/0 per dozen.
Ditto, dessert knives, 24/0 per dozen.
Ditto, carvers, 10/0 per pair.
Ditto, with ornamented shoulders, 36/0, 30/0.
Ditto, carvers, 12/0 per pair.
The best electro silver-plated table spoons and forks, 40/0 per dozen.
Ditto, dessert spoons and forks, 30/0 per dozen.
Tea, salt, egg, and mustard spoons, 16/0 per dozen.
Gravy spoons, 7/0 each.
Soup ladles, 12/0 each.
Carved wood bread trays and butter dishes, from 5/0 each.
Bread knives, table steels, corkscrews, razors, scissors, pocket knives, needles.
Knives made expressly for use in all the various trades.

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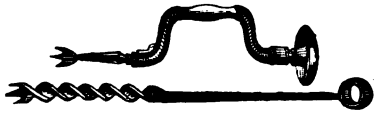
[6512]

HANNAH, ALEXANDER, *Calton, Glasgow.*—Screw-augers, braces, bracebits, and all kinds of tools for boring wood.



The braces, bits, augers, &c. made by A. Hannah, bear the stamp, "Thompson, Glasgow."

[6513]

HARDY, THOMAS, 44 *Milton Street, Sheffield.*—Button-hooks, nail files, corkscrews, stilettoes, tweezers, nut picks, &c.

[6514]

HARGREAVES, SMITH, & Co., *Eyre Lane, Sheffield.*—Sheffield cutlery and hardware. (*See page* 161.)

[6515]

HASLAM, JOHN, & SONS, *Ridgeway, near Sheffield.*—Scythes, sickles, and reaping hooks.

[6516]

HAWCROFT, WILLIAM, & SONS, *Bath Works, 53 Bath Street, Sheffield.*—Razors of superior quality in great variety of pattern and mounting.

[6517]

HAYWOOD, JOSEPH, & Co., *Sheffield.*—Pruning knife, and cutlery in general.

[6518]

HEATH, SIMEON, *Union Place Paddock, Walsall.*—Improved spring splitting machine, and general assortment of saddlers' tools.

[6519]

HILL, J. V., 5 *Gray's Inn Road, King's Cross.*—Samples of London-manufactured saws.

[6520]

HOWARTH, JAMES, *Broomspring Works, Sheffield.*—Edge tools; joiners', engravers', carvers' and turners' tools; augers, skates, &c.

Obtained Prize Medals from the London, 1851, *and Paris,* 1855, *Exhibitions, and Special Medal of Honour from the Society of Arts and Industry,* 1856, *for superior quality of goods exhibited.*

[6521]

JACKSON, NEWTON, & Co., *Sheaf Island Works, Sheffield.*—Steel files, saws, edge tools, cutlery, sheep shears.

[6522]

JOLLEY, JOHN & THOMAS, *Excelsior Works, Warrington.*—Files, railway-ticket nippers, telegraph vices, and engineers' tools.

The following are the manufactures of Messrs. JOLLEY, of which specimens are exhibited:—

Files, telegraph vices and nippers, railway-ticket nippers, stock taps and dies, wrenches, spanners, ratchet drills, cast-steel hammers, saws for buhl, iron, and steel, bench vices, hand vices, screw-plates, plain, wing, rack and millwrights' compasses, squares, spring dividers, index, plain, wing, rack in and out, pocket, and spring callipers, handcuffs, &c.

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HARGREAVES, SMITH, & Co., *Eyre Lane, Sheffield.*—Sheffield cutlery and hardware.

BREAD KNIFE.

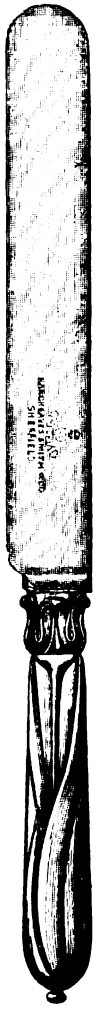

TABLE AND DESSERT KNIVES.

HARGREAVES, SMITH, & Co. exhibit—

1. One dozen carved ivory-handle table and dessert knives in a case of coromandel wood.

2. A carved ivory-handle bread knife.

HARGREAVES, SMITH, & Co. Manufacturers, Sheffield.

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[6523]

JOWITT, THOMAS, & SON, *Sheffield.*—Specimens of manufactured steel, and files for engineers and exportation.

[6525]

KING & PEACH, *Hull.*—Planes, various.

[6526]

KINGSBURY, THOMAS, 9 *New Bond Street.*—Cutlery; cutlery applied to dressing-cases of a new construction.

[6527]

LINNEKER, RAVEL & JAMES, *Cobnar Works, Sheffield.*—Scythes, sickles, chaff machine knives, and straw knives.

REAPING AND STRAW-CUTTING MACHINE KNIVES, SCYTHES, SICKLES, AND HOOKS.

The temper of the edge is produced by a new process, ensuring perfect regularity; also, the back part of machine knives, scythes, &c. are made spring temper to prevent breakage and increase the strength (see *Engineer*, July 16, 1861, page 31). Every article is of the best and most modern construction, and supplied in patterns suitable for all countries. Established 1768.

[6528]

MAPPIN BROTHERS, 222 *Regent Street,* 67 *&* 68 *King William Street, City, and Queen's Cutlery Works, Sheffield.*—Cutlery.

[6529]

MAPPIN & CO., *opposite the Pantheon, Oxford Street, London.*—Their celebrated cutlery from their works at Sheffield. (*See pages* 164 *and* 165.)

[6530]

MARSH, BROTHERS, & CO., *Ponds Works, Sheffield.*—Steel files, saws, tools, cutlery, railway and carriage springs.

[6531]

MATTHEWMAN, B., & SONS, *Milton Works, Sheffield.*—Pocket and table cutlery, razors, scissors, &c.

[6532]

MATTHEWMAN, BENJAMIN, JUN., 80 *Milton Street, Sheffield.*—Scissors, with miniature photograph of the Royal Family.

[6533]

MECHI & BAZIN, 4 *Leadenhall Street, and* 112 *Regent Street.*—Fine cutlery—razors, table knives, scissors, sporting and pen knives.

[6534]

MITCHELL, J. W., 1 *Bridge House Place, Newington Causeway.*—Saws and tools.

These tools are of the best materials, and moderate prices. Lists will be sent on application.

[6535]

MITCHELL, WILLIAM HENRY, 3 *Britannia Place, Limehouse, E.*—Hand, panel, and tenon saws.

London-made saws, frames, and other tools for cabinet makers, carpenters, and shipwrights. These goods are of excellent quality, and their prices are moderate.

[6536]

MOLYNEUX, W., *Prescot.*—Varieties of Lancashire files.

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[6537]

MONK, THOMAS, 74 *Edward Street, Birmingham.*— Moulders, plasterers', and stonemasons tools.

[6538]

MOSELEY, JOHN, & SON, 54 *Broad Street, Bloomsbury, London.*—Planes and other joiners' tools.

[6539]

MOSELEY, JOHN, & SON, 27 *Bedford Street, and* 17 *&* 18 *King Street, Covent Garden.*—Cutlery and tools.

[6540]

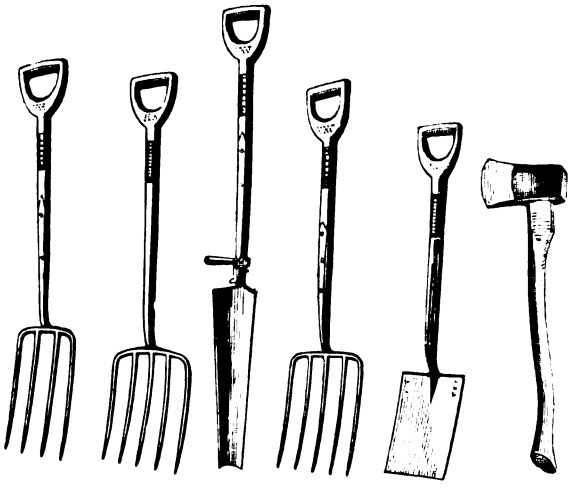
MUSHET, ROBERT, & Co., *Coleford and Sheffield.*—Cutlery of all kinds; edge tools, and samples of steel.

[6541]

NURSE, C., *Mill Street, Maidstone.*—Carpenters' planes.

[6542]

PARKES, FRANCIS, & Co., *Sutton Works, Birmingham.*—Cast-steel forks, spades, draining, edge, and plantation tools.



CAST-STEEL FORKS, &c.

Cast-steel forks, four to twelve prongs, for lifting tan, coke, malt, chaff, and other light substances.
Cast-steel forks, three to eight prongs, for dung, stones, and bulbous roots.
Cast-steel forks, three to six prongs, for digging, subsoiling, and clearing land.
Cast-steel forks, two to three prongs, for harvesting.
Solid cast-steel spades and shovels.
Solid cast-steel draining tools.
Draining tools partly of steel.
Spades and shovels, the surface of which is plated with cast-steel.
Cast-steel hoes, for gardening and plantation.
Cast-steel axes, hatchets, pickaxes, and mattocks, hedging bills, &c.
Cast-steel ploughshares.

[6543]

PARKIN, JOHN, *Steel Works, Harvest Lane, Sheffield.*—Saws, files, machine knives, paper-makers' bars and tools.

[6544]

PEACE, WARD, & Co., *Agenoria Steel Works, Sheffield.*—Steel files, tools, saws, hammers, machine springs; cutlery.

[6545]

RODGERS, JOSEPH, & SONS, 6 *Norfolk Street, Sheffield.*—Pocket, pen, and sportsmen's knives, table cutlery, razors, scissors, fish carvers.

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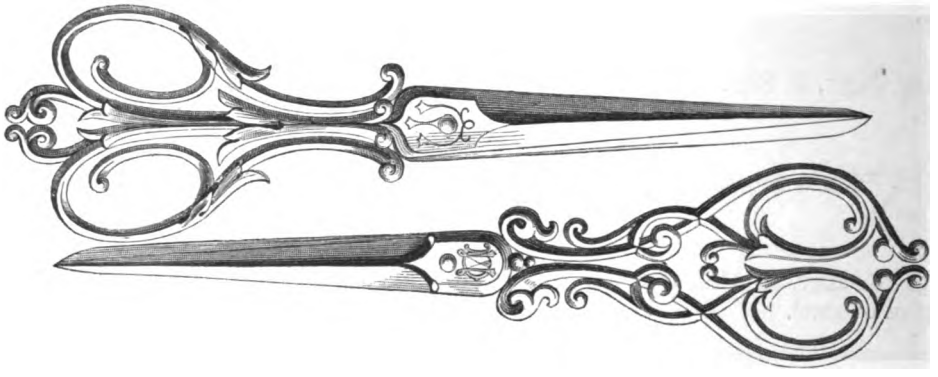
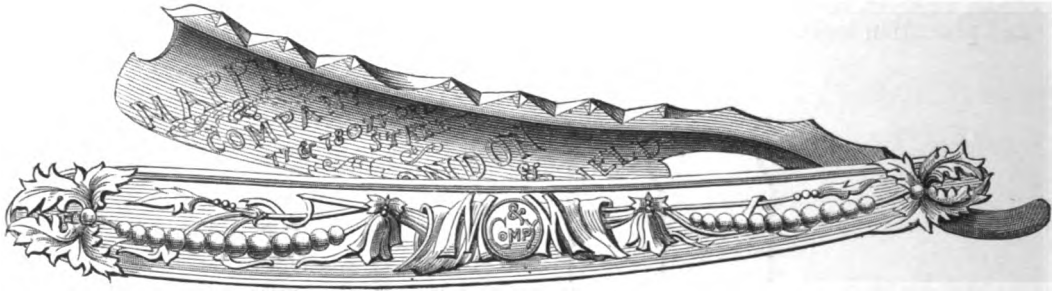
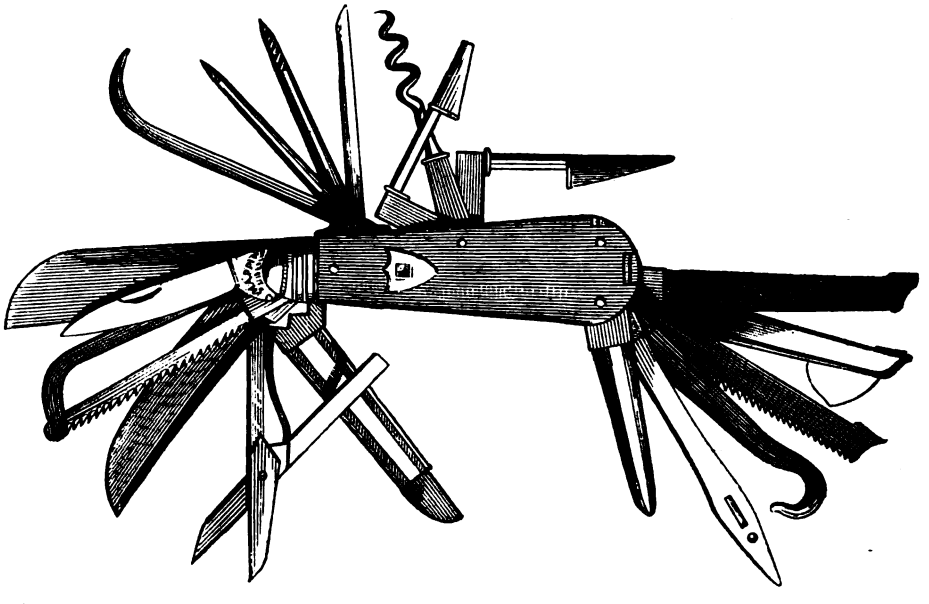
MAPPIN & COMPANY, 77 & 78 *Oxford Street, London, opposite to the Pantheon.*—Celebrated cutlery.



Mappin & Co.'s scissors have long been famous for their exquisite quality and finish. They can be had as low in price as 1/0 per pair, and a set of three in a handsome case for 5/0.



Mappin & Co.'s razors, well known for their great keenness, are well represented in the Exhibition. Their 1/0 razor has a world-wide reputation, and an enormous sale.



Mappin & Co.'s penknives, and sportsmen's knives for hunting, angling, &c. are of the finest quality, and of perfect mechanism; the specimens exhibited are beautifully fluted, as specimens of what can be done with stee for ornamental cutlery.

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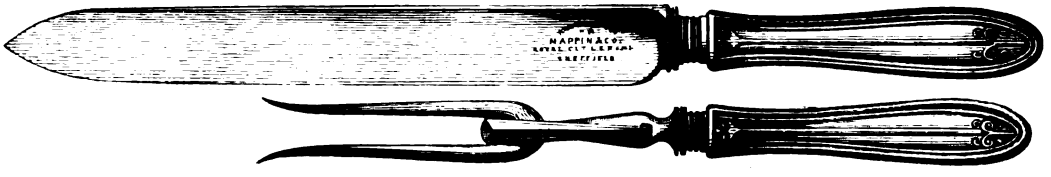
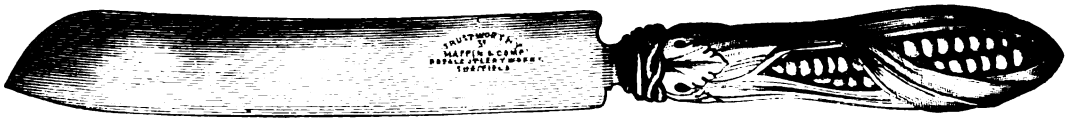
MAPPIN & COMPANY, *continued.*

Table knives with secure ivory handles, balanced, from 13/0 per dozen.

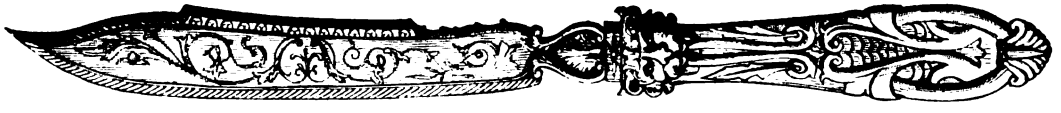
All Mappin & Co.'s table cutlery is made of the best double shear steel, and warranted.



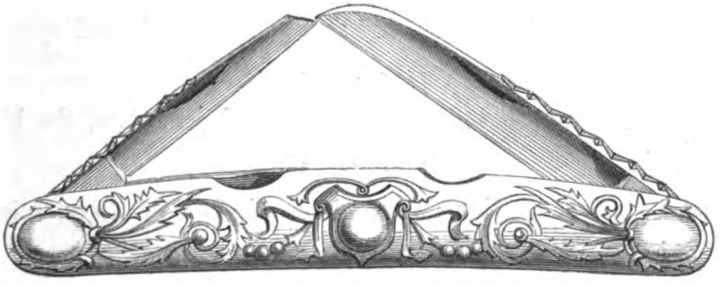
Carvers, with secure ivory handles, 4/6 per pair.



Bread knives with beautifully carved wood and ivory handles, the quality of steel warranted.



The above is one of the best designs exhibited for a dessert knife, being artistic in form, and of a most convenient shape for use. It is an admirable specimen of Mappin & Co.'s manufactures in this department, in which they greatly excel.



Mappin & Co.'s pen and pocket knives are unequalled for the excellence of the steel and other material used, and the exquisite finish with which they are put together; the prices also at which they are produced are very low—a most serviceable knife with ivory handle and two blades of the very best steel being sold for 1/0; selected beautiful knives with pearl and tortoiseshell handles elaborately fluted, four best steel blades, to 10/6 each.

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[6546]

RUSSELL, THOMAS, & CO., *Canada Works, 38 Charles Street, Sheffield.*—Saws.

The exhibitors are proprietors of the marks "Russell & Horsfield," "John Sanderson," and the corporate mark,

Their case contains specimens of back saws with electro-plated back, hand saws with etched blade and Albert shield on handle, and other varieties of saws.

[6547]

SAGGERSON, E., *Prescot.*—Clock, watch, and jewellers' and various other Lancashire files.

[6548]

SAYNOR & COOKE, *Paxton Works, Sheffield.*—Pruning, budding knives, scissors, &c.

[6549]

SHAW, J., *Dauntless Works, Sheffield.*—Saws and tools for various trades.

[6550]

SHIRLEY, WILLIAM, *Crescent Works, 19 Carver Street, Sheffield.*—Pen, pocket, sportsman, dirk, and bowie knives.

[6551]

STEER & WEBSTER, *Castle Hill Works, Sheffield.*—Scissors, razors, knives, table cutlery, &c.

[6552]

SUTTON, W., & SONS, *New Town Row, Birmingham.*—Awl blades.

[6553]

TAYLOR, H., 105 *Fitzwilliam Street, Sheffield.*—Various trades' tools.

[6554]

THOMAS, RICHARD, *Icknield Edge-Tool Works, Birmingham.*—Edge tools for home and foreign markets.

[6555]

TUTON, MATHEW, *Scarbro' Road, Driffield.*—One stand forks and hedge tools.

[6556]

UNWIN & ROGERS, *Rockingham Street, Sheffield.*—Table and spring knives, razors, and every description of cutlery.

[6557]

WALDROW, WILLIAM, & SONS, *Bellbroughton, Stourbridge.*—Scythe, hay and chaff knife, hook, and edge tools.

[6558]

WARD, GEORGE, 171 *Eyre Street, Sheffield.*—Fine pen, pocket, desk, and sportsmen's knives, lancets, &c.

[6559]

WARD, THOMAS, 31 *Brightmore Street, Sheffield.*—Improved penknives, the blades cannot be injured in shutting.

[6560]

WILKINSON, THOMAS, & SON, 17 *New Church Street, Sheffield.*—Cutlery, scissors, improved tailors' shears, &c.

[6561]

WILKINSON, WILLIAM, & SONS, *Spring Works, Grimesthorpe, near Sheffield.*—Sheep, horse, glovers', thatchers', and other shears.

[6562]

WINKS, B., & SONS, 55 *Earl Street, Sheffield.*—Razors, table knives, and scalping blades.

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[6563]

WOSTENHOLM, GEORGE, & SON, *Washington Works, Sheffield.*—Pen, pocket, table, bowie, and sportsmen's knives; razors and scissors.

***Obtained the Prize Medal at the Exhibition in* 1851, *and the large Gold Medal at the Paris Exhibition*, 1855.**

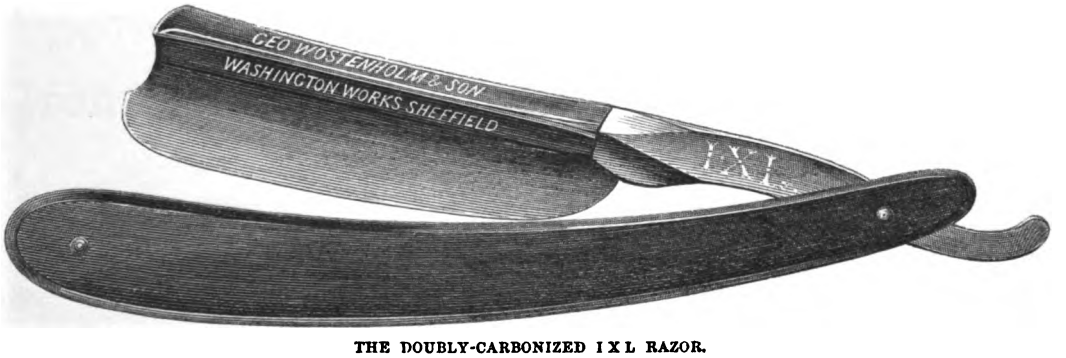
Prize Medal, Exhibition of 1851.

CORPORATE MARK.

Prize Medal, Exhibition of 1851.

Paris Exhibition, 1855.

The only Gold Medal awarded for English Cutlery.



THE DOUBLY-CARBONIZED I X L RAZOR.

GEORGE WOSTENHOLM & SON are the sole manufacturers of the IXL table, pen, pocket, and bowie knives, dirks, scissors, and razors. These goods, for quality and workmanship, are unsurpassed. The gold medal obtained at the Paris Exhibition by the IXL cutlery, was the only one awarded to English cutlers. The exhibitors confidently recommend their registered doubly-carbonized IXL razors, which, for chasteness of design, exquisite finish, and fine shaving properties, are unsurpassed. These razors are hardened and tempered by a peculiar and secret process.

George Wostenholm & Son are the sole manufacturers of the genuine congruent and fine pipe razors. These are really good and useful articles.

LONDON:
R. CLAY, SON, AND TAYLOR, PRINTERS,
BREAD STREET HILL.

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INTERNATIONAL EXHIBITION, 1851.

MEDAL AWARDED

TO

PEYTON & HARLOW.

(See *Official Illustrated Catalogue*, Part XII., Class 31.)

PEYTON & PEYTON,

BORDESLEY WORKS, BIRMINGHAM,

49 LONG ACRE, W.C., and 46 MOORGATE STREET, LONDON, E.C.

MANUFACTURERS OF

BRASS AND IRON BEDSTEADS,

SOFAS, COUCHES, AND CHAIRS,

Of every description, and suitable for all markets;

BRASS DESK AND OTHER RAILINGS AND PICTURE RODS,

AND OF THE

IMPROVED HAT AND UMBRELLA STANDS,

Of Brass and Iron, or of Wrought and Cast Iron combined;

AND

Iron Founders, Machinists, and Engineers.

PEYTON & PEYTON (the original firm having been PEYTON & HARLOW) at various times introduced the following among other Patented Improvements in the manufacture of Brass and Iron Bedsteads:—The Dovetail Joints and the use of Chilled Castings in Head and Foot Rails (both now universally adopted), under their original Patent (Church & Harlow's), dated 16th December 1841; the Improved Iron Lath Sacking; the Patented Process for Ornamenting Brass Bedsteads and Japanned Iron Bedsteads, in imitation of Papier Mâché; and they now request particular attention to

THEIR RECENT IMPROVEMENTS,

Secured to them by FIVE PATENTS, under the protection of which the Bedsteads exhibited in the International Exhibition 1862 are manufactured, viz.:—

An improved method of fixing tester and curtain rods together, and of fixing the brackets which support the testers and pillars of Bedsteads. (Patent dated 21st April 1860.)

An improved mode of attaching the sides and ends of Bedsteads, whereby a more massive and more ornamental appearance can be given to the pillars (Patent dated 9th June 1860)—this object being further attained by the use of improved moulds or chills employed in casting the pillars. (Provisional protection granted 20th November 1861.)

An improved method of making the dovetail joints of Bedsteads, whereby the lath bottoms can be attached and tightened in the simplest and firmest manner, by an inexperienced person, and without any spanner or other loose article, or any part liable to derangement, such as a turning stud. (Provisional protection granted 18th October 1861.)

An improved bottom for Bedsteads, both metallic and wooden, which, while it possesses great elasticity, is not liable to sink in the middle—a defect much complained of, and difficult to remedy. (Provisional protection granted 22nd November 1861.)

SHOW ROOMS

BORDESLEY WORKS, BIRMINGHAM, & 49 LONG ACRE, LONDON, W.C.

Where a Stock is kept of 2000 FINISHED BEDSTEADS.

CITY OFFICE—46 MOORGATE STREET, E.C.

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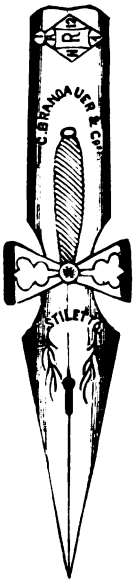

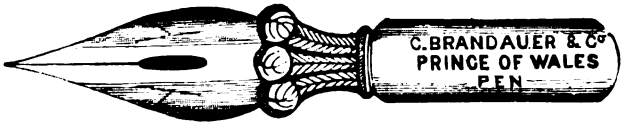

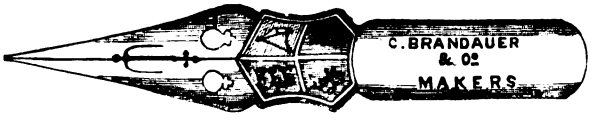

REPRESENTATIONS OF STEEL PENS,

AS MADE BY

C. BRANDAUER & CO.

Manufacturers of Steel Pens of every description,

NEW JOHN STREET PEN WORKS,

BIRMINGHAM.

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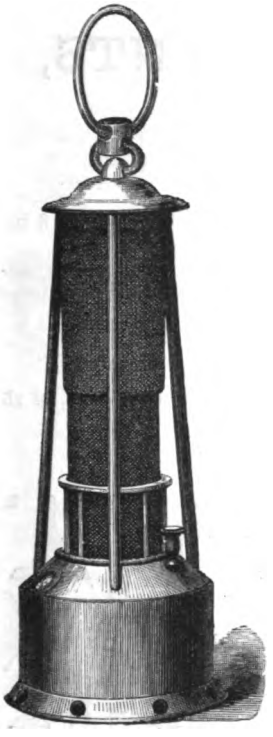
IMPROVED PATENT SAFETY LAMP FOR COAL MINES.



This Lamp combines several important advantages, viz.:

1st. *Without the use of glass*, it gives from three to four times the light of the 'Davy.'

2nd. It never requires snuffing; thus not only keeping the inside of the Lamp from getting foul, but giving less trouble to the miner, and at the same time producing a more even light.

3rd. It will, on account of its peculiar construction, consume, whilst burning with a good flame, from one to two cubic feet of gas per minute (the light being thereby improved), thus tending oftentimes, though in a small degree, to prevent the accumulation of gas, and so to some extent to lessen the risk of explosion.

4th. Owing to the fact of the gas passing into the Lamp principally from below, the gauze that covers the flame does not readily become red-hot.

5th. It can be instantly extinguished, if required, without trouble—a matter of great importance in case of a sudden irruption of gas.

6th. The lock is very simple, though entirely differing in principle from all others now in use, and is rendered perfectly secure by means of a seal placed over the lock, and completely concealing it in such a manner as to render it *absolutely impossible to open the Lamp without breaking the seal*, thus forming a perfect detector.

7th. The great increase, however, in the light would of itself remove the chief temptation to open the Lamp, added to which, it gives if anything *less* light when opened.

8th. It is also, under ordinary circumstances, impossible to light a pipe by drawing the flame through the gauze (as is the case with the 'Davy').

9th. Nor, for the same reason, can the flame (as in the 'Davy') be driven through the gauze by a current of air, which has been supposed to be the cause of so many explosions.

10th. There is also another patent improvement in this Lamp which will be hailed by the miner as a great boon—viz., *an insulated handle*, which enables it at all times to be carried without inconvenience, however hot the rest of the Lamp may become.

N.B.—These LAMPS ARE MADE ENTIRELY BY MACHINERY, and carefully superintended by the Patentee, so as to insure perfect accuracy in the fitting of the separate parts, *which are very simple*, and are so constructed that any part, if accidentally damaged or lost, can be at once replaced—without trouble and at small cost—a stock being always kept on hand for that purpose.

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Ironfounders & Smiths,

CONTRACTORS FOR ALL KINDS OF IRON CASTINGS AND SMITHS' WORK, MAKERS OF THE BEST AND CHEAPEST CLOSE-FIRE RANGES.

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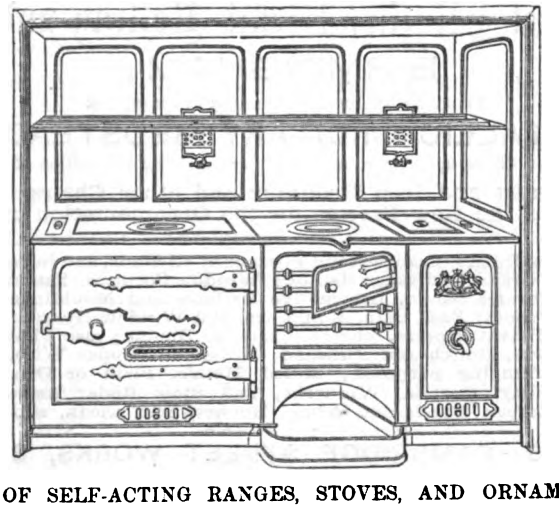

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Rolled Iron Girders, for Fire-proof Buildings, to 18 in. deep; Flat Bars, to 12 in.; Rounds, to 8 in.; Squares, to 5 in.

Bevilled, Half-round, Oval, Octagon, Hexagon, Fire, Sash, and Patent Shoe Bars; Angle, Tee Rivet, Cable, and Boat Guard Iron. Fencing and Drawn Wire. Single, Double, and Latten Sheets. Boiler Plates, Hoops, Strip, Nail Rods, Galvanised Iron, and Corrugated Sheets for Roofing.

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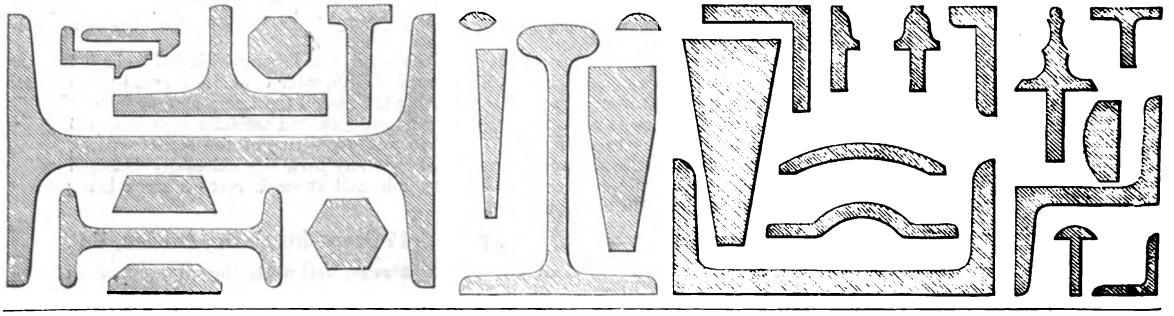

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Patentees of the New Process for the Ornamentation of Metals;

AND MANUFACTURERS OF

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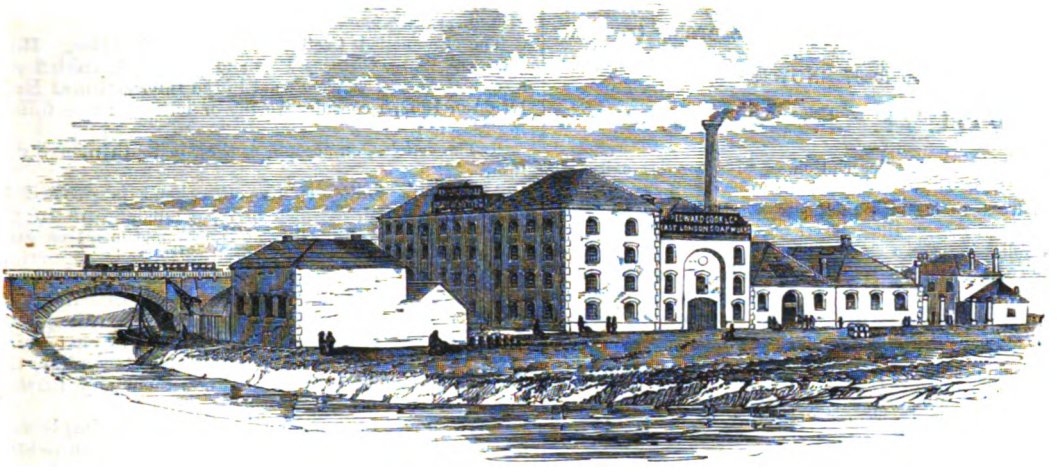

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Benjamin Edge, of Coalport, invented the Flat Chain with Wood Key in 1812, when the Russian war made Hemp so excessively high in price. It is gratifying to state, that no loss of life has been occasioned by any flat chain from this Manufactory during the whole period of 50 years. Copies of Testimonials may be had at the Stand in the Exhibition.

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Best Table Knives, with Balance Ivory Handles			30/ doz.
Ditto Dessert	ditto	ditto	24/ ,,
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Razors, Scissors, Pen Knives, Pocket Knives, Corkscrews, Needles, &c.

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[*See Engraving, Class* 31.]

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2. Their durability, on the other hand, is proved by the high temperature which they have undergone in the Enamelling Stoves, showing at the same time the good quality of the cast iron and the well-calculated proportions of the form.
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4. The price of the articles, in view of their simple and quick production, is a very low one, and I leave competent persons to judge of their Enamel and other advantages.

HENRIETTA MINE, 22nd February 1862.

The Exhibitor,
WILLIAM GÜTZLOE.

[*Class* 31.]

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For information of the aid afforded by the Science and Art Department of the Committee of Council of Education, towards obtaining instruction in Science and Art in reference to industrial occupations, see the Illustrated Catalogue of the International Exhibition, Class 29.

By order of the Lords of the Committee on Education.

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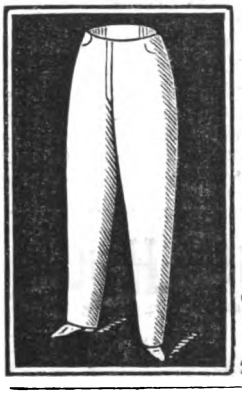

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USED IN THE ROYAL LAUNDRY,
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See that you get it, as inferior kinds are often substituted.
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RAGGETT'S INTERNATIONAL BRANDY,
24*s* per Gallon. Sample Bottles, 4*s* 6*d*.

The Wines of the Season.

BLOCKEY'S LONDON STOUT
(See Dr. Hassall's Analytical Report.)
Price List free on application to
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VISCOUNT PALMERSTON and the majority of the Nobility patronise the newly-invented Patent Tinted Spectacles. They give extraordinary relief, by day and night, to weak, dim, and defective vision.—Messrs. SOLOMONS, Opticians, 39 Albemarle Street, Piccadilly.

[*May* 1*st*, 1862.

ROYAL HORTICULTURAL SOCIETY.

REMAINING ARRANGEMENTS FOR THE EXHIBITIONS AND MEETINGS IN 1862,

TO BE HELD AT

THE GARDEN, SOUTH KENSINGTON, W.

May 2, Friday. Council, and Meeting for Election of Fellows.
,, 6, Tuesday. Fruit and Floral Committee.
,, 12, Monday. Meeting for Election of Fellows.
,, 16, Friday. Council.
,, 21, WEDNESDAY. FIRST GREAT SHOW, and Fruit and Floral Sub-Committee.
,, 28, Wednesday. Election of Fellows, and Ballot for Plants.
,, 30, Friday. Opening day of American Show.

*** During June there will be a Grand Show of American Plants by Messrs Waterer and Godfrey, of Knaphill Nursery, Woking, Surrey.

June 6, Friday. Council, and Meeting for Election of Fellows.
,, 11, WEDNESDAY. SECOND GREAT SHOW, and Fruit and Floral Sub-Committee.
,, 20, Friday. Council, and Meeting for Election of Fellows.
,, 26, THURSDAY. ROSE SHOW, and Fruit and Floral Sub-Committee.
July 2, WEDNESDAY. THIRD GREAT SHOW, and Fruit and Floral Sub-Committee.
,, 4, Friday. Council, and Meeting for Election of Fellows.
,, 18, Friday. Council.
,, 22, Tuesday. Fruit and Floral Committee.
August 1, Friday. Council, and Meeting for Election of Fellows.
,, 12, Tuesday. Fruit and Floral Committee.
,, 26, Tuesday. Fruit and Floral Committee.
Sept. 5, Friday. Council, and Meeting for Election of Fellows.
,, 10, WEDNESDAY. SHOW OF AUTUMN FLOWERS, and Fruit and Floral Sub-Committee.
,, 23, Tuesday. Fruit and Floral Committee.

*** At some period during the season it is expected that the Memorial of the Exhibition of 1851 will be finished, and probably publicly uncovered.

October 3, Friday. Council.
,, 8, Wednesday. Fruit and Floral Sub-Committee.
,, 8, 9, & 10. GREAT INTERNATIONAL SHOW OF FRUIT, GOURDS, ROOTS, VEGETABLES, AND CEREALS. The Show of Gourds, Roots, and Cereals to continue until the 18th.
Nov. 7, Friday. Council, and Meeting for Election of Fellows.
,, 11, Tuesday. Fruit and Floral Committee.
Dec. 5, Friday. Council.
,, 9, Tuesday. Fruit and Floral Committee.
,, 19, Friday. Council.

Ladies and gentlemen wishing to become Fellows, must be proposed by some Fellow by whom they are known. Rules and Forms can be obtained of Mr. A. MURRAY, Assistant Secretary.

ADMISSION OF THE PUBLIC.

I.—GREAT MEETINGS.

May 21. FIRST GREAT MEETING
June 11. SECOND DITTO
July 2. THIRD DITTO
UNCOVERING OF THE MEMORIAL OF 1851.

Admission by tickets, price 5*s*. each, purchased previously to the day of the Show. If payment is made at the door, 7*s*. 6*d*. will be charged for each admission.

II.—HORTICULTURAL EXHIBITIONS.

May 30.	OPENING DAY OF THE AMERICAN SHOW, but contingent upon the season	2*s*. 6*d*.
June 26.	ROSE SHOW	2*s*. 6*d*.
Sept. 10.	AUTUMN FLOWER SHOW ...	2*s*. 6*d*.
Oct. 8.	FRUIT & VEGETABLE SHOW	2*s*. 6*d*.
,, 9.	DITTO	1*s*. 0*d*.
,, 10.	DITTO	1*s*. 0*d*.
,, 11—18.	GOURDS AND ROOTS ...	1*s*. 0*d*.

Admission by payment at the door, or by tickets previously purchased.

III.—ORDINARY DAYS.

May 1 ... ... 5*s*. 0*d*.
,, 2 ... ... 5*s*. 0*d*.
,, 3 ... ... 5*s*. 0*d*.

From 5th May to 31st May.

Sundays	No admission by payment.	Wednesdays	(Band) ... 1*s*. 0*d*.
Mondays	(Band) ... 1*s*. 0*d*.	Thursdays	(Band) ... 1*s*. 0*d*.
Tuesdays	(Band) ... 1*s*. 0*d*.	Fridays	(Band) ... 2*s*. 6*d*.
		Saturdays	(Bands) ... 5*s*. 0*d*.

From 2nd June to 18th October.

Sundays ... ... No admission by payment.
Mondays ... (Band)
Tuesdays ... (Band)
Wednesdays (Band) ... Gardens alone ... ... 1*s*. 0*d*.
Thursdays (Band) Gardens and Exhibition ... 2*s*. 6*d*.
Fridays ... (Band) Gardens from Exhibition ... 1*s*. 0*d*.
Saturdays ... (Bands) ... ... 2*s*. 6*d*.

ANDREW MURRAY, *Assistant Secretary.*

56
1909

DEUTSCHES MUSEUM MÜNCHEN BIBLIOTHEK

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BY AUTHORITY OF HER MAJESTY'S COMMISSIONERS.

1. THE INDUSTRIAL CATALOGUE. Containing the Name and Address of every Exhibitor, with a Brief Description of his Goods. Price 1*s.*

2. THE FINE ARTS CATALOGUE. Containing the Name of the Artist and the Title of every Work of Art exhibited, and the Name of the Exhibitor. Price 1*s.*

3. A CONCISE HISTORY OF THE INTERNATIONAL EXHIBITION OF 1862: Its Rise and Progress, its Building and Features, and a Summary of all former Exhibitions. By JOHN HOLLINGSHEAD. With Numerous Illustrations and Plans. Price 2*s.* 6*d.*

4. THE OFFICIAL ILLUSTRATED CATALOGUE. Containing the Name and Address of every British Exhibitor, and detailed Descriptions of Articles exhibited. Illustrated with many hundred Engravings. In Thirteen Parts, price 1*s.* each.

CLASS.	PART 1.
1.	Mining, Quarrying, Metallurgy, and Mineral Products.
2.	Chemical Substances and Products, and Pharmaceutical Processes.
3.	Substances used for Food, including Wines.
4.	Animal and Vegetable Substances used in Manufactures.
	PART 2.
5.	Railway Plant, including Locomotive Engines and Carriages.
6.	Carriages not connected with Railroads.
	PART 3.
7.	Manufacturing Machines and Tools.
	PART 4.
8.	Machinery in general.
	PART 5.
9.	Agricultural and Horticultural Machines and Implements.
	PART 6.
10.	Civil Engineering, Architectural, and Building Contrivances.
11.	Military Engineering, Armour and Accoutrements, Ordnance, and Small Arms.
12.	Naval Architecture and Ship's Tackle.
	PART 7.
13.	Philosophical Instruments and Processes depending upon their use.
14.	Photographic Apparatus and Photography.
15.	Horological Instruments.
16.	Musical Instruments.
17.	Surgical Instruments and Appliances.

CLASS.	PART 8.
18.	Cotton.
19.	Flax and Hemp.
20.	Silk and Velvet.
21.	Woollen and Worsted, including Mixed Fabrics generally.
22.	Carpets.
23.	Woven, Spun, Felted, and Laid Fabrics, when shown as specimens of Printing or Dyeing.
24.	Tapestry, Lace, and Embroidery.
	PART 9.
25.	Skins, Fur, Feathers, and Hair.
26.	Leather, including Saddlery and Harness.
27.	Articles of Clothing.
	PART 10.
28.	Paper, Stationery, Printing, and Bookbinding.
29.	Educational Works and Appliances.
	PART 11.
30.	Furniture and Upholstery, including Paper-hangings and Papier-maché.
	PART 12.
31.	Iron and General Hardware.
32.	Steel and Cutlery.
	PART 13.
33.	Works in Precious Metals, and their imitations, and Jewellery.
34.	Glass.
35.	Pottery.
36.	Manufactures not included in previous classes.

5. HUNT'S HAND-BOOK TO THE OFFICIAL CATALOGUES. An Explanatory Guide to the Natural Productions and Manufactures of the International Exhibition, 1862. By ROBERT HUNT, ESQ., F.R.S., F.S.S., &c., Author of the Synopsis and Hand-Book to the Official Catalogues of 1851. Price 6*d.* each Part; or bound in two Volumes, price 7*s.*

Part 1. Raw Materials and Manufactures directly from them. Chemicals, Food, &c.
„ 2. Machinery, Tools, Implements.
„ 3. Engineering, Civil and Military. Naval Architecture, &c.
„ 4. Iron and Steel. Metal Manufactures, Precious Metals.
Part 5. Jewellery. Glass. Fictile Manufactures.
„ 6. Textile Materials and Manufactures, &c.
„ 7. General Manufactures, (Handicraft.)
„ 8. Philosophical Instruments, &c. Paper, Printing, &c. Education.
„ 9. The British Colonial Possessions.
„ 10. Foreign Countries.

And of E. STANFORD, 6, Charing Cross, London, S.W.

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And of E. STANFORD, 6, Charing Cross, London, S.W.

7. GROUND PLANS OF THE BUILDING, THE GALLERIES, THE ANNEXES. AND THE HORTICULTURAL GARDENS. Price 3*d.*

8. VIEW OF THE INTERNATIONAL EXHIBITION BUILDING, SOUTH FRONT. Engraved by J. Le Keux, from a Drawing by Godfrey Sykes. Price 6*d.*

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10. PHOTOGRAPHIC VIEWS OF THE EXHIBITION, &c. By the London Stereoscopic Company. *At various prices.*

11. MEDALS STRUCK IN THE BUILDING. *At various prices.*

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[*May 1st*, 1862.

INTERNATIONAL EXHIBITION, 1862.

Regulations with respect to the Admission of Visitors to the Exhibition.

1. The Exhibition will open at Ten in the morning (except on Saturdays, when it will open at Twelve), and will close at Seven in the evening in May, June, and July, and half an hour before sunset after that date. Bells will be rung a quarter of an hour before closing.

2. The Royal Horticultural Society having arranged a new entrance to their Gardens from Kensington Road, the Commissioners have agreed to establish entrances to the Exhibition from the Gardens, and to issue a joint ticket, giving the owner the privilege of admission both to the Gardens and to the Exhibition on all occasions when they are open to visitors, including the Flower Shows and Fêtes held in the Gardens, up to the 18th of October, 1862.

3. There are two principal entrances for visitors:—
(1.) In Prince Albert's Road.
(2.) In Exhibition Road.
And four secondary entrances. Three of these are from the Horticultural Gardens, for the owners of the joint tickets, Fellows of the Society, and other visitors to the Gardens, and one in Cromwell Road for the Picture Galleries. There are several exit doors.

4. The regulations necessary for preventing obstructions and danger at the several entrances will be issued from time to time.

5. Admittance to the Exhibition will be given only to the owners of Season Tickets, and to visitors paying at the doors.

Season Tickets.

6. There are two classes of Season Tickets:
The 1st, price £3 3*s*., entitles the owner to admission to the Exhibition at all times when the Building is open to the public.
The 2nd, price £5 5*s*., confers the same privileges of admission to the Exhibition, and further entitles the owner to admission to the Gardens of the Royal Horticultural Society at South Kensington and Chiswick (including Flower Shows and Fêtes at these Gardens) during the continuance of the Exhibition.

Prices of Admission.

7. On the 1st of May, admission is restricted to the owners of Season Tickets.

8. On the 2nd and 3rd of May, the price of admission is £1 for each person; and the Commissioners reserve to themselves the power of appointing three other days, when the same charge will be made.

9. From the 5th to the 17th of May, 5*s*.

10. From the 19th to the 31st of May, 2*s*. 6*d*., except on the Saturday in each week, when the charge will be 5*s*.

11. After the 31st of May, the price of admission on Monday, Tuesday, Wednesday, and Thursday in each week will be 1*s*.; on Fridays, 2*s*. 6*d*.; on Saturdays, 5*s*.

Refreshment and Retiring Rooms.

12. Refreshments are provided according to an authorised scale of charges hung up in the rooms. The First and Second Class rooms are on the North side of the building, looking into the Horticultural Gardens. Other rooms are in the Eastern and Western Annexes.

13. There are Retiring Rooms, Lavatories, &c., in the North-East Transept and the South-East Transept, adjoining Exhibition Road, and in the North-West Transept and South-West Transept, adjoining Prince Albert's Road. There are also two Retiring Rooms, for Ladies only, in the Galleries on the South side of the Building, adjoining Cromwell Road. A moderate charge is made for the use of Waiting Rooms.

Lost Articles.

14. Inquiries respecting articles lost or found should be made at the Police Office, in the South Central Court.

Post Office. Railway Inquiry Office, Telegraph Office.

15. The Post Office for the use of Visitors is at the end of the North-East Transept, on the right hand. Letters for the Country may be posted till 4·45 p.m. The Railway Inquiry Office is in the North-East Tower. The Telegraph Office is at the Central Entrance, in Cromwell Road.

Sale of Articles, &c.

16. No article is allowed to be sold in the Exhibition, except the Official Catalogues, Photographs, Medals struck in the Building, and Refreshments; and no articles are allowed to be taken out without authority.

17. Opera-glasses may be had on hire at a moderate charge.

18. *Visitors are strictly forbidden to touch any of the articles exhibited.*

(By Order) F. R. Sandford, *Secretary.*

[*May 1st*, 1862.

ROYAL HORTICULTURAL SOCIETY.

REMAINING ARRANGEMENTS FOR THE EXHIBITIONS AND MEETINGS IN 1862,

TO BE HELD AT

THE GARDEN, SOUTH KENSINGTON, W.

May 2, Friday. Council, and Meeting for Election of Fellows.
,, 6, Tuesday. Fruit and Floral Committee.
,, 12, Monday. Meeting for Election of Fellows.
,, 16, Friday. Council.
,, 21, Wednesday. First Great Show, and Fruit and Floral Sub-Committee.
,, 28, Wednesday. Election of Fellows, and Ballot for Plants.
,, 30, Friday. Opening day of American Show.

*** During June there will be a Grand Show of American Plants by Messrs Waterer and Godfrey, of Knaphill Nursery, Woking, Surrey.

June 6, Friday. Council, and Meeting for Election of Fellows.
,, 11, Wednesday. Second Great Show, and Fruit and Floral Sub-Committee.
,, 20, Friday. Council, and Meeting for Election of Fellows.
,, 26, Thursday. Rose Show, and Fruit and Floral Sub-Committee.
July 2, Wednesday. Third Great Show, and Fruit and Floral Sub-Committee.
,, 4, Friday. Council, and Meeting for Election of Fellows.
,, 18, Friday. Council.
,, 22, Tuesday. Fruit and Floral Committee.
August 1, Friday. Council, and Meeting for Election of Fellows.
,, 12, Tuesday. Fruit and Floral Committee.
,, 26, Tuesday. Fruit and Floral Committee.
Sept. 5, Friday. Council, and Meeting for Election of Fellows.
,, 10, Wednesday. Show of Autumn Flowers, and Fruit and Floral Sub-Committee.
,, 23, Tuesday. Fruit and Floral Committee.

*** At some period during the season it is expected that the Memorial of the Exhibition of 1851 will be finished, and probably publicly uncovered.

October 3, Friday. Council.
,, 8, Wednesday. Fruit and Floral Sub-Committee.
,, 8, 9, & 10. Great International Show of Fruit, Gourds, Roots, Vegetables, and Cereals. The Show of Gourds, Roots, and Cereals to continue until the 18th.
Nov. 7, Friday. Council, and Meeting for Election of Fellows.
,, 11, Tuesday. Fruit and Floral Committee.
Dec. 5, Friday. Council.
,, 9, Tuesday. Fruit and Floral Committee.
,, 19, Friday. Council.

Ladies and gentlemen wishing to become Fellows, must be proposed by some Fellow by whom they are known. Rules and Forms can be obtained of Mr. A. Murray, Assistant Secretary.

ADMISSION OF THE PUBLIC.

I.—GREAT MEETINGS.

May 21. First Great Meeting
June 11. Second Ditto
July 2. Third Ditto
Uncovering of the Memorial of 1851.

Admission by tickets, price 5*s*. each, purchased previously to the day of the Show. If payment is made at the door, 7*s*. 6*d*. will be charged for each admission.

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June 26.	Rose Show	2*s*. 6*d*.
Sept. 10.	Autumn Flower Show ...	2*s*. 6*d*.
Oct. 8.	Fruit & Vegetable Show	2*s*. 6*d*.
,, 9.	Ditto	1*s*. 0*d*.
,, 10.	Ditto	1*s*. 0*d*.
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,, 2 ... ... 5*s*. 0*d*.
,, 3 ... ... 5*s*. 0*d*.

From 5th May to 31st May.

Sundays	No admission by payment.	Wednesdays (Band)	1*s*. 0*d*.
		Thursdays (Band)	1*s*. 0*d*.
Mondays	(Band) 1*s*. 0*d*.	Fridays (Band)	2*s*. 6*d*.
Tuesdays	(Band) 1*s*. 0*d*.	Saturdays (Bands)	5*s*. 0*d*.

From 2nd June to 18th October.

Sundays	No admission by payment.		
Mondays (Band)	Gardens alone		1*s*. 0*d*.
Tuesdays (Band)	Gardens and Exhibition		1*s*. 6*d*.
Wednesdays (Band)	Gardens from Exhibition		0*s*. 6*d*.
Thursdays (Band)			
Fridays (Band)	... ...		2*s*. 6*d*.
Saturdays (Bands)	... ...		5*s*. 0*d*.

ANDREW MURRAY, *Assistant Secretary.*

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